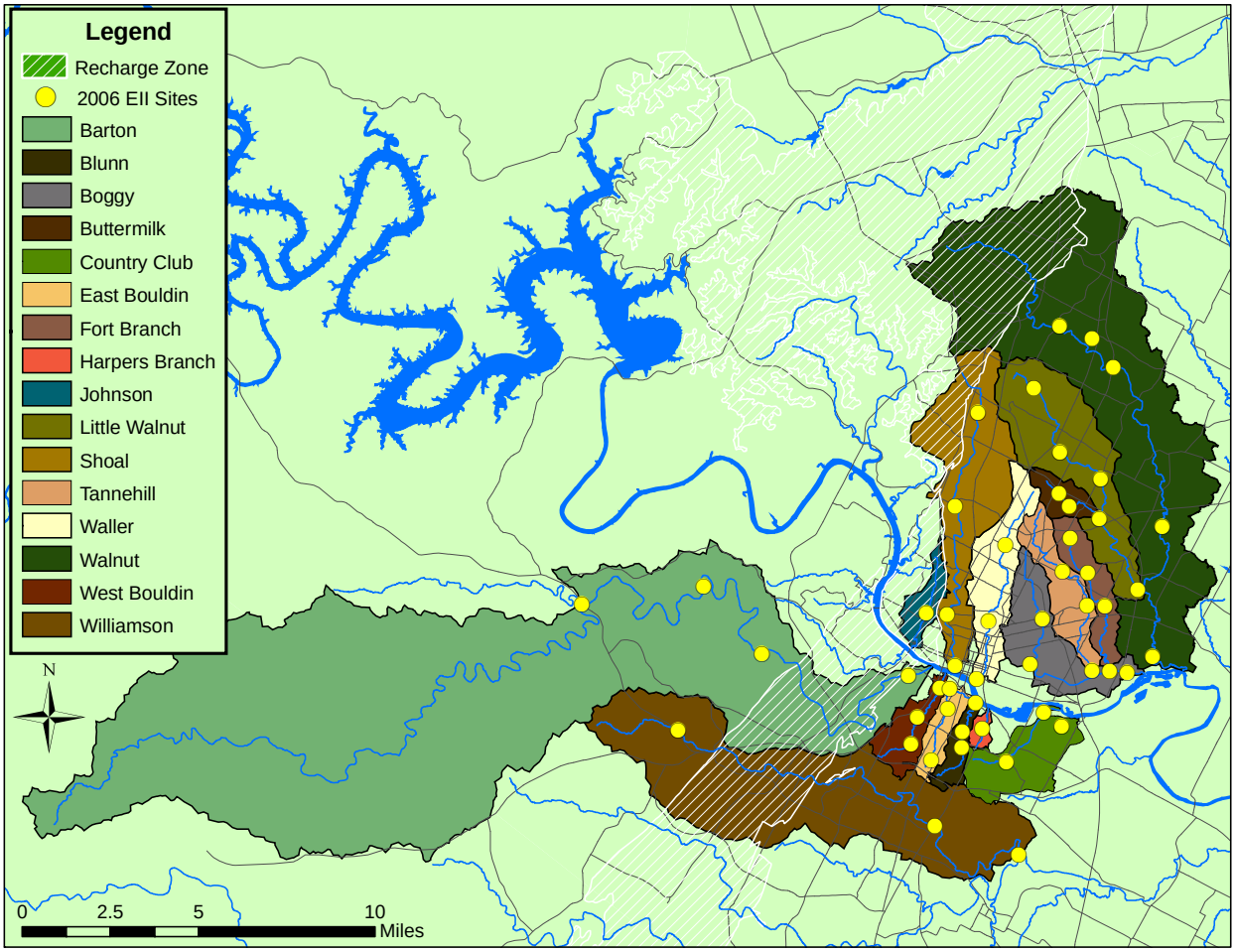
Environmental Integrity Index
Phase 1 (2006) Watershed Summary Report



Watershed Protection
Development Review

Short Report- Completed November 2007
Andrew Clamann

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city of austin
Watershed Protection

EII Phase I (2006) Watersheds Report

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Environmental Integrity Index (EII) Phase I data collected during 2006 are presented and reviewed. Sixteen of the 46 watersheds throughout the greater Austin area were analyzed to assess environmental conditions. These values are in use as part of the Citywide WPDRD masterplan in prioritizing subwatersheds to address through Capital Improvement Projects, regulations and/or programs. The values are also used in the WPDRD Business Plan as performance measures for water quality maintenance.

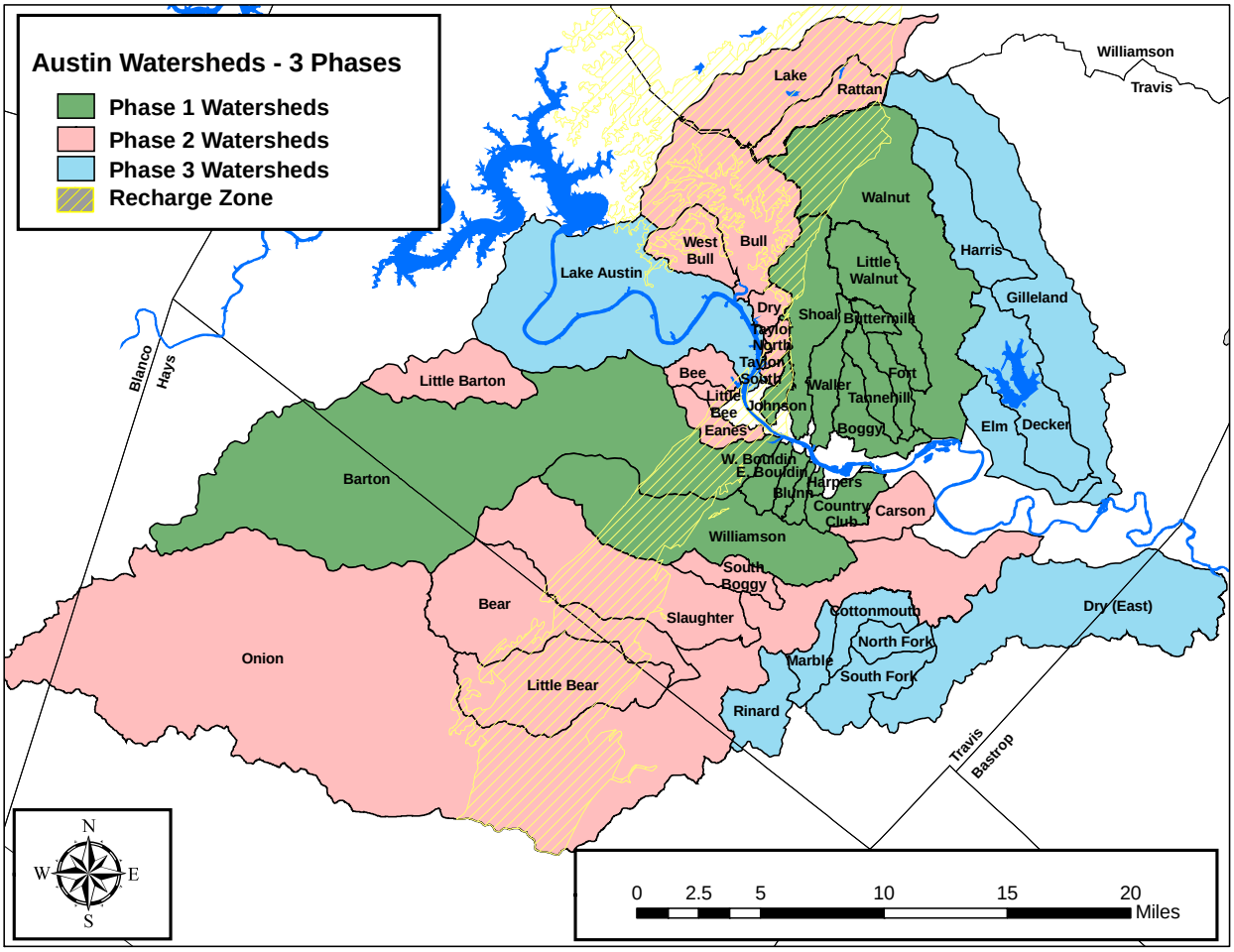
Introduction

Since 1990, the City of Austin has conducted water quality monitoring for the creeks and streams in and around the Austin area, including Lake Austin and Town Lake. Originally, this monitoring began as a citizen volunteer based program called Water Watchdogs. In 1999, the Water Watchdog program shifted from using volunteers to City staff for practical and quality control reasons. During this transition, the program was also expanded for use as part of technical assessments used in the citywide WPDRD masterplan. With the rapid growth of the Austin metropolitan area, this program helps track the changes in environmental quality in our streams. Currently, the Environmental Integrity Index (EII) involves the monitoring of all 46 watersheds within the City's planning area and over 161 sample sites. The monitoring of these 46 watersheds is organized into three separate phases. One phase is sampled per year allowing for a three-year rotation in monitoring. Table 1 presents the current watersheds included in the three phases of the EII sampling program, and Figure 1 shows the locations of each watershed.

Table 1. EII Creeks and their Respective Phases

Phase 1	Phase 2	Phase 3
Barton Creek	Bear Creek	Cottonmouth Creek
Blunn Creek	Bee Creek	Decker Creek
Boggy Creek	Bull Creek	Dry Creek
Buttermilk Creek	Carson Creek	Elm Creek
Country Club Creek	Dry Creek	Gilleland Creek
East Bouldin Creek	Eanes Creek	Harris Branch
Fort Branch	Huck's Slough (not sampled in 2004)	Lake Austin tributaries
Harpers Branch	Lake Creek	Marble Creek
Johnson Creek	Little Barton Creek	North Fork (Dry Creek)
Little Walnut Creek	Little Bear Creek	Rinard Creek
Shoal Creek	Little Bee Creek	South Fork (Dry Creek)
Tannehill Branch	Onion Creek	
Waller Creek	Rattan Creek	
Walnut Creek	Slaughter Creek	
West Bouldin Creek	South Boggy Creek	
Williamson Creek	Taylor Slough (North)	
	Taylor Slough (South)	
	West Bull Creek	

Figure 1. Phase Map for EII Creek Monitoring



As shown by Figure 1, with the exception of the Barton, Williamson and Walnut watersheds, the Phase 1 watersheds are primarily smaller, urban watersheds, that drain into Lake Ladybird (Town Lake), while Phases 2 and 3 encompass the typically suburban and less developed watersheds. The three phases have correspondingly decreasing levels of impervious cover. Estimations of percent impervious cover for most of Austin's watersheds were calculated in 1997 by the Center for Research in Water Resources (CRWR) program and are presented in Figure 2.

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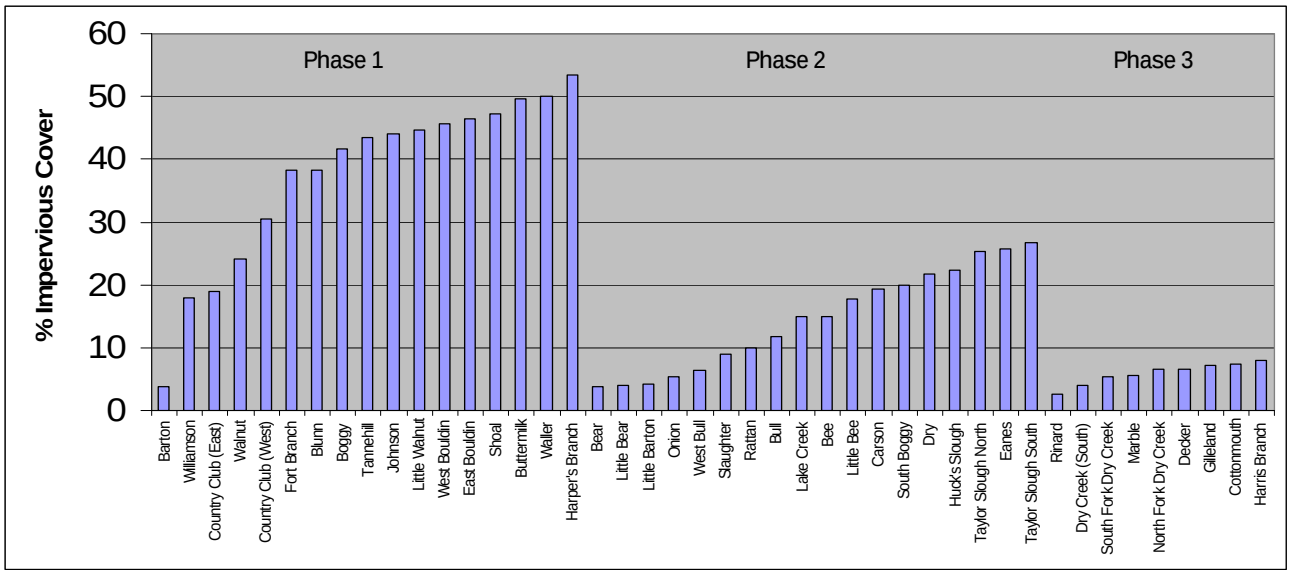
Figure 2. Percent Impervious Cover Estimations for Phase 1, 2 and 3 Watersheds (1997 CRWR data)*



*some watersheds were not evaluated in the 1997 CRWR program

This report presents data collected for the EII monitoring program in 2006 and covers the associated water quality, habitat, and biological data. Some data from the previous phase I sampling event (2003) is included for comparison. A detailed discussion of EII calculation methods can be found in the Environmental Integrity Index Methodology Report (COA-ERM 1999-01). Biological raw data including species lists and metrics is presented in Appendix A and B. Raw data from water samples is presented in Appendix C

Methods

During the 2006 Phase 1 sampling period there were a total of 50 water quality sampling sites in 16 different watersheds (Table 2). All data was collected adhering to the Water Resource Evaluation Standard Operating Procedures Manual (COA SOP 2004). As part of these procedures, the collection of a sample at any given site is contingent upon there being baseflow conditions (see COA SOP for criteria for these conditions). This reduces the influence of recent stormwater or drought conditions.

Quarterly water quality and annual biological sampling events involve field parameter measurements which were collected with a multiprobe:

- Dissolved Oxygen (mg/L)
- Specific Conductivity (µS/cm)
- pH (Standard Units)
- Water Temperature (^{o}C)

Water samples collected from the quarterly 2006 Phase I sites were analyzed at the LCRA lab for:

- Ammonia as N (mg/L)
- Sulfate (mg/L)

Water samples collected from the quarterly 2006 Phase I sites were analyzed at the COA lab for:

- Turbidity (NTU)
- Nitrate as N (mg/L)
- Orthophosphorus as P (mg/L)
- Total Suspended Solids (mg/L)
- E. coli bacteria (col/100ml)

The annual biological sampling event includes:

- Benthic macroinvertebrate and diatom survey
- Stream and reach stability assessment
- Non-contact recreational assessment
- Habitat assessment
- Flow measurement
- Conventional field parameters

Data from all five sampling events (quarterly water quality events and one biological event) is analyzed, in part, through the use of nine Sub-index calculations that are calculated for each of the 16 watersheds (for detailed description of calculation methods, see the EII Methodology Report (COA-ERM 1999-01).

- Aquatic Life Use Score
- Benthic Macroinvertebrate Score
- Diatom Score
- Water Quality Score
- Contact Recreation Score
- Non-Contact Recreation Score
- Sediment Quality Score
- Physical Integrity Score
- Overall Watershed Score

Table 2. 2006 EII Phase 1 Coordinated Monitoring Schedule*

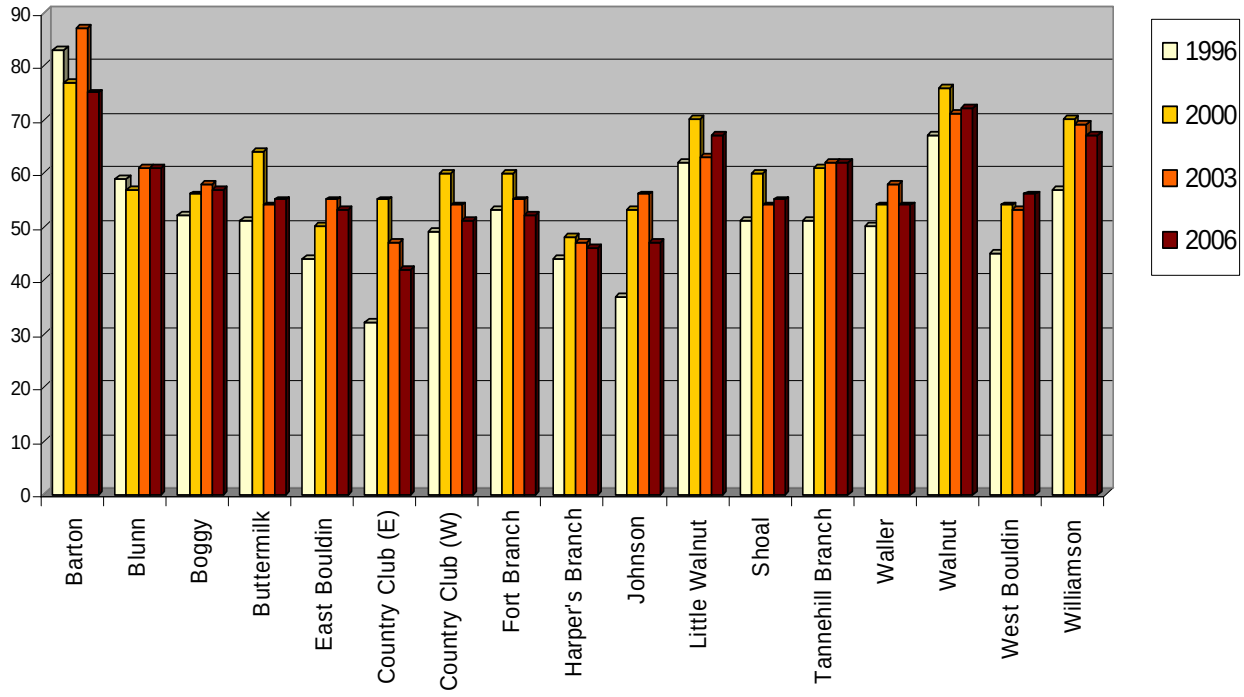
Watershed	Site	Site Name	Feb 22 WQ	May 18 WQ	Jul 5-12 Habitat	Aug 23 WQ	Nov 29 WQ	COA Team
Barton	879	Barton Creek Between Dams Above Pool	n	B	n	n	n	EG/CH
Barton	51	Barton Creek Downstream of Lost Creek	B	B	B	B	B	EG/CH
Barton	49	Barton Creek at Ogletree Pool	B		B	B		EG/CH
Barton	48	Barton Creek at Hwy 71 Below Little Barton	B	B	B	B	B	EG/CH
Blunn	180	Blunn Creek above Riverside Drive	B	B	B	B	B	MG/RC
Blunn	364	Blunn Creek above Big Stacy Pool	B	B	B	B	B	MG/RC
Blunn	362	Blunn Creek at Longbow	B	B	B	B	B	MG/RC
Boggy	493	North Boggy Creek at Delwau Lane	n	n	B	n	n	MG/RC
Boggy	837	North Boggy Creek at Nile Street	B	B	B	n	B	MG/RC
Boggy	2754	North Boggy Creek at Manor	B	B	B	n	B	MS/SM
Buttermilk	851	Buttermilk Creek at Little Walnut Creek	B	B	B	B	B	MS/SM
Buttermilk	782	Buttermilk Creek at Providence Ave	n	B	B	n	n	MS/SM
Buttermilk	3861	Buttermilk at Victory Christian Center	B	B	B	B	B	MS/SM
Country Club (East)	1475	East Country Club Creek at ACC	B	n	n	n	B	EG/CH
Country Club (West)	1474	West Country Club Creek at Krieg Fields	n	n	n	n	n	EG/CH
Country Club (West)	850	West Country Club Creek at East Oltorf	B	B	B	n	B	EG/CH
East Bouldin	1338	East Bouldin Creek at Post Oak	B	B	B	n	n	EG/CH
East Bouldin	119	East Bouldin Creek at Elizabeth St	B	B	B	n	B	MG/RC
East Bouldin	121	East Bouldin Creek d/s of W. Alpine	B	B	B	n	n	MG/RC
Fort Branch	123	Fort Branch at North Boggy	n	n	n	n	n	MG/RC
Fort Branch	898	Fort Branch at Carson Hill (Single Shot)	n	n	n	n	n	MS/SM
Fort Branch	125	Fort Branch above Manor Rd	B	B	B	n	B	MS/SM
Fort Branch	126	Fort Branch at Glencrest	B	B	B	B	B	MS/SM
Harper's Branch	844	Harper's Branch at Woodland Ave	B	B	B	n	B	MG/RC
Johnson	897	Johnson Creek at Woodmont	n	B	B	n	B	AC/SH
Little Walnut	634	Little Walnut Creek at US 183	B	B	B	B	B	AC/SH
Little Walnut	3857	Little Walnut Creek at Cameron	B	B	B	B	B	AC/SH
Little Walnut	3860	Little Walnut Creek at Georgian	B	B	B	B	B	AC/SH
Little Walnut	838	Little Walnut Creek at Golden Meadow	B	B	B	n	B	AC/SH
Shoal	122	Shoal Creek Above 1st Street	B	B	B	B	B	MS/SM
Shoal	116	Shoal Creek at 24th St	B	B	B	n	B	AC/SH
Shoal	117	Shoal Creek at Shoal Edge Court	B	B	B	n	B	AC/SH
Shoal	118	Shoal Creek downstream of CrossCreek	B	B	B	n	B	AC/SH
Tannehill Branch	1476	Tannehill Branch at Desirable Drive	n	n	B	n	B	MG/RC
Tannehill Branch	843	Tannehill Creek at Lovell	B	B	B	n	B	MS/SM
Tannehill Branch	3858	Tannehill Branch at Berkman	B	B	B	n	B	MS/SM
Waller	38	Waller Creek Below Cesar Chavez	B	B	B	B	B	MS/SM
Waller	624	Waller Creek upstream of 23rd Street	B	B	B	B	B	MS/SM
Waller	780	Waller Creek at 51st Street	B	B	B	n	B	MS/SM
Walnut	503	Walnut Creek at SP Railroad Bridge	B	B	B	n	B	MG/RC
Walnut	502	Walnut Creek at Old Manor Road	B	B	B	B	B	AC/SH
Walnut	464	Walnut Creek below IH 35	B	B	B	B	B	AC/SH
Walnut	463	Wells Branch at Walnut Metro Park	B	B	B	B	B	AC/SH
Walnut	895	Walnut Creek at Metric	B	B	B	B	B	AC/SH
West Bouldin	2794	West Bouldin Creek at Post Oak	n	n	n	n	n	EG/CH
West Bouldin	3854	West Bouldin Creek at Oltorf	B	B	B	B	B	MG/RC
West Bouldin	3856	West Bouldin Creek at Cardinal and Locke	B	B	B	n	n	MG/RC
Williamson	223	Williamson Creek at McKinney Falls	B	B	B	B	B	EG/CH
Williamson	491	Williamson Creek at IH35	n	n	B	n	B	EG/CH
Williamson	490	Williamson Creek at Hwy 71	n	B	B	n	n	EG/CH

* B = baseflow conditions n = no flow present Blue = Samples were taken Grey = Samples were not taken Blank = Site not visited

Results

Although the 2006 scores were higher than 1996 scores, they were generally lower than both 2000 and 2003 scores, which may be attributable to prolonged drought conditions. As can be seen in Figure 3, the Barton Creek watershed has consistently scored higher than the other watersheds. In contrast, the East Country Club watershed typically scores marginally lower than the other watersheds. The scores from 2006 were no exception, Barton Creek scored the highest and East Country Club Creek scored the lowest.

Figure 3. The overall EII scores the 1996, 2000, 2003 and 2006 Phase 1 watersheds presented in alphabetical order (total score range 0-100).



Water chemistry variables for each site in each watershed are summarized alphabetically in Figures 4a – 4j. These box and whisker plots facilitate comparison of within-site variability among the quarterly data points, and within-stream variability along a watershed from upstream to downstream and watershed comparisons among all phase 1 creeks.

Figure 4a. pH data from quarterly samples collected at phase 1 sites during 2006

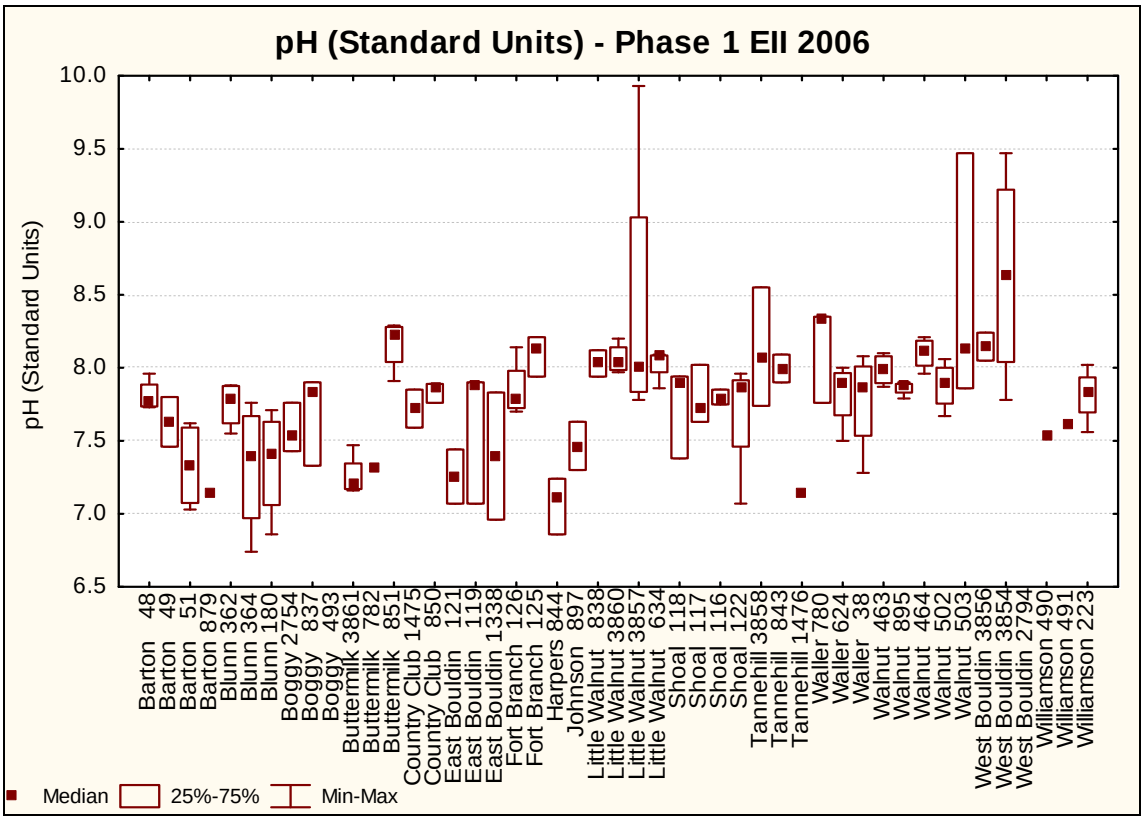


Figure 4b. Conductivity data from quarterly samples collected at phase 1 sites during 2006

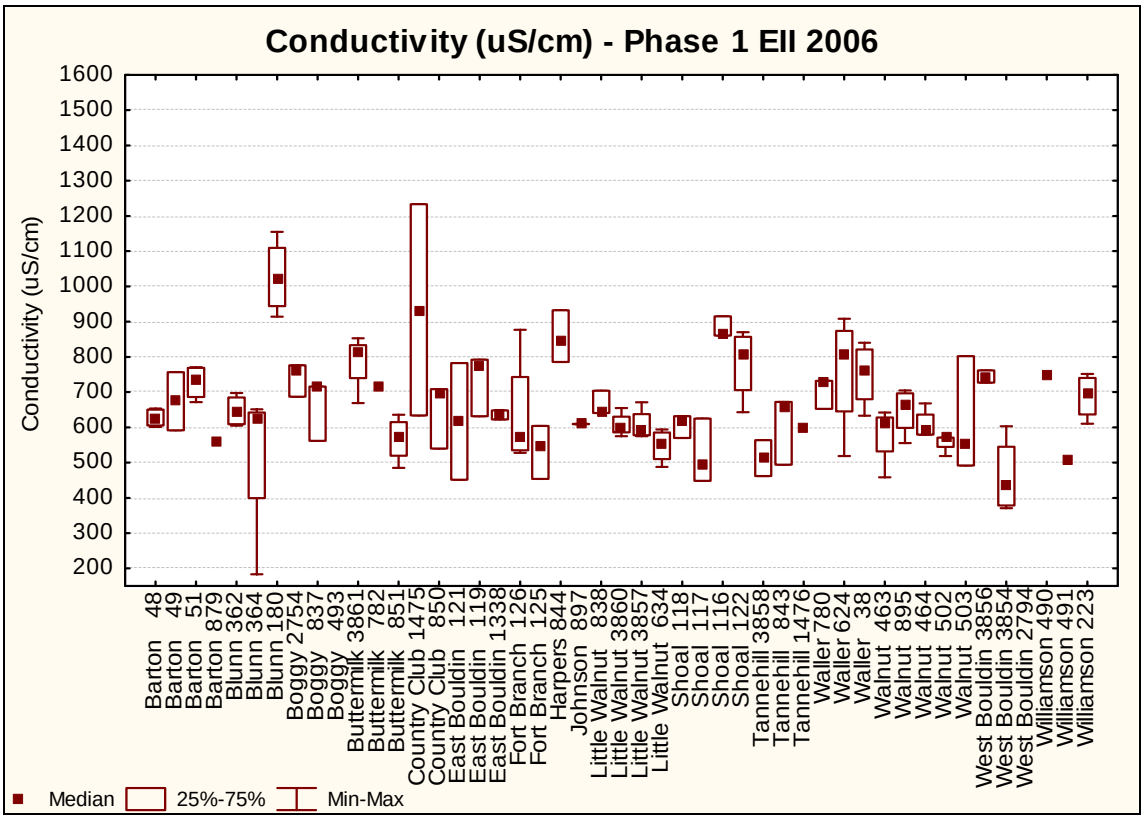


Figure 4c. Dissolved oxygen data from quarterly samples collected at phase 1 sites during 2006

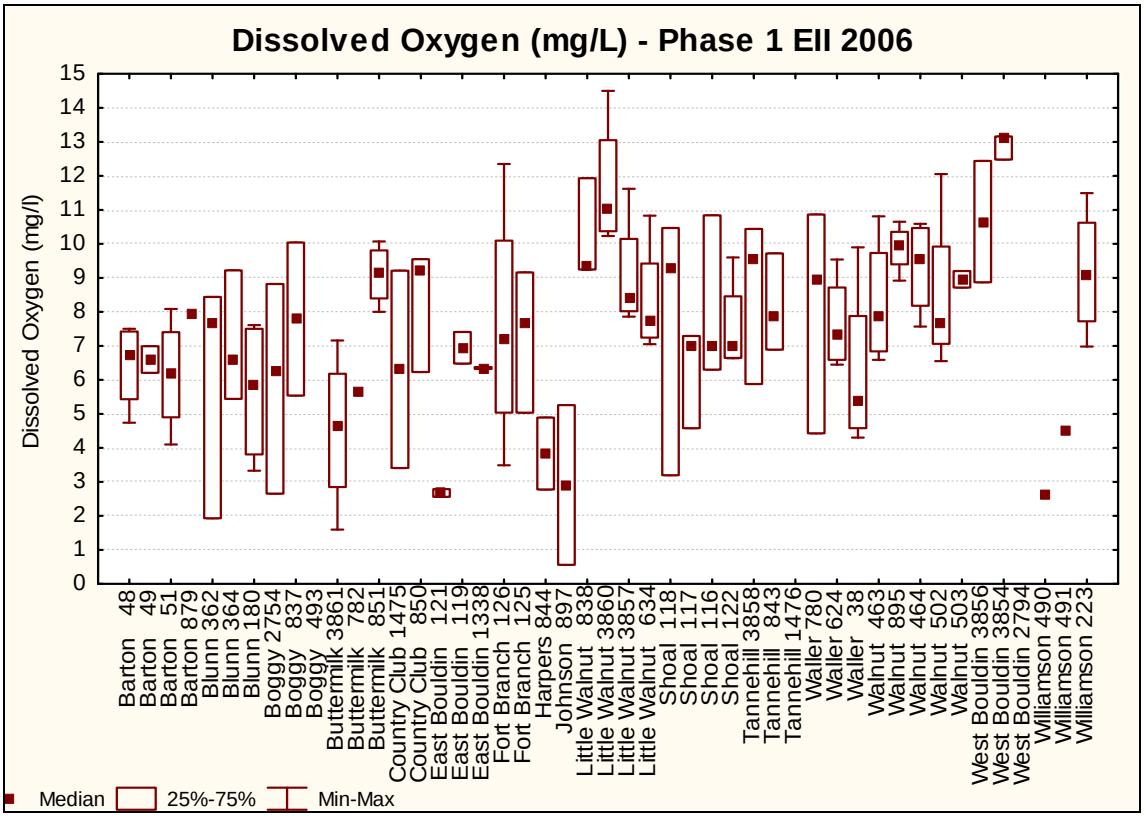


Figure 4d. Orthophosphorus data from quarterly samples collected at phase 1 sites during 2006

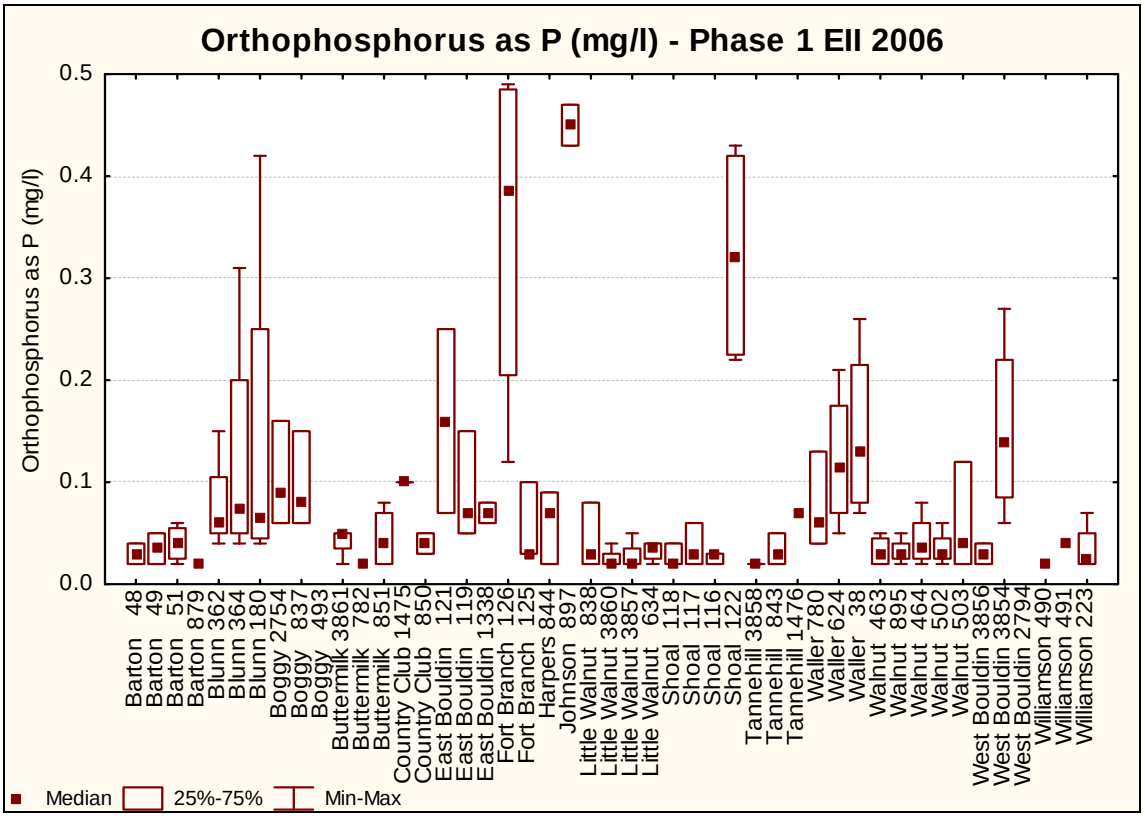


Figure 4e. Ammonia data from quarterly samples collected at phase 1 sites during 2006

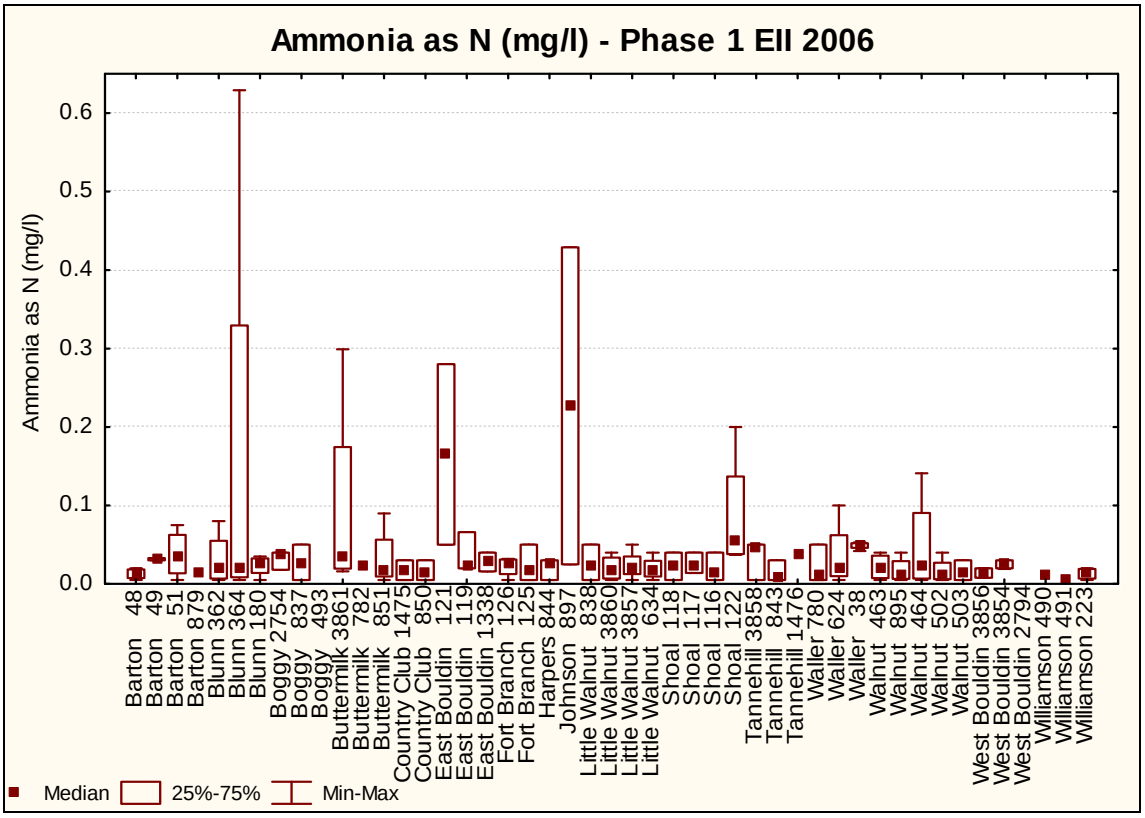


Figure 4f. Nitrate data from quarterly samples collected at phase 1 sites during 2006

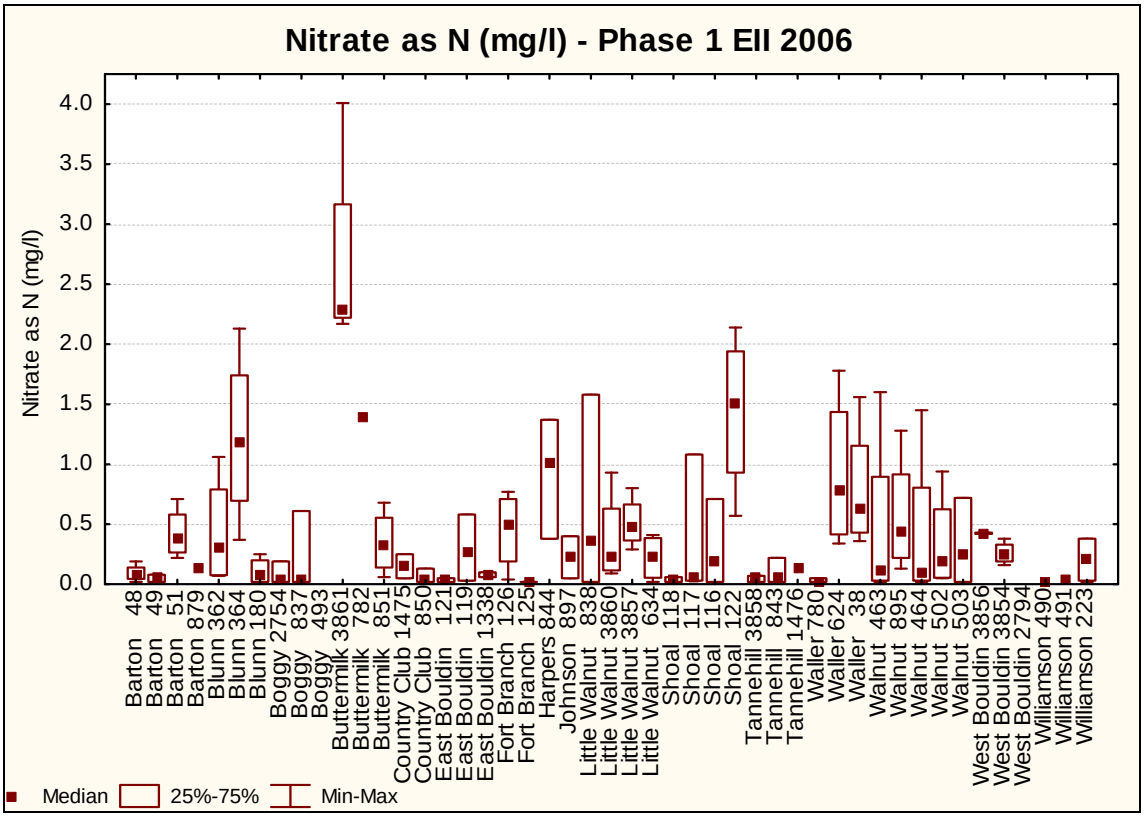


Figure 4g. TSS data from quarterly samples collected at phase 1 sites during 2006

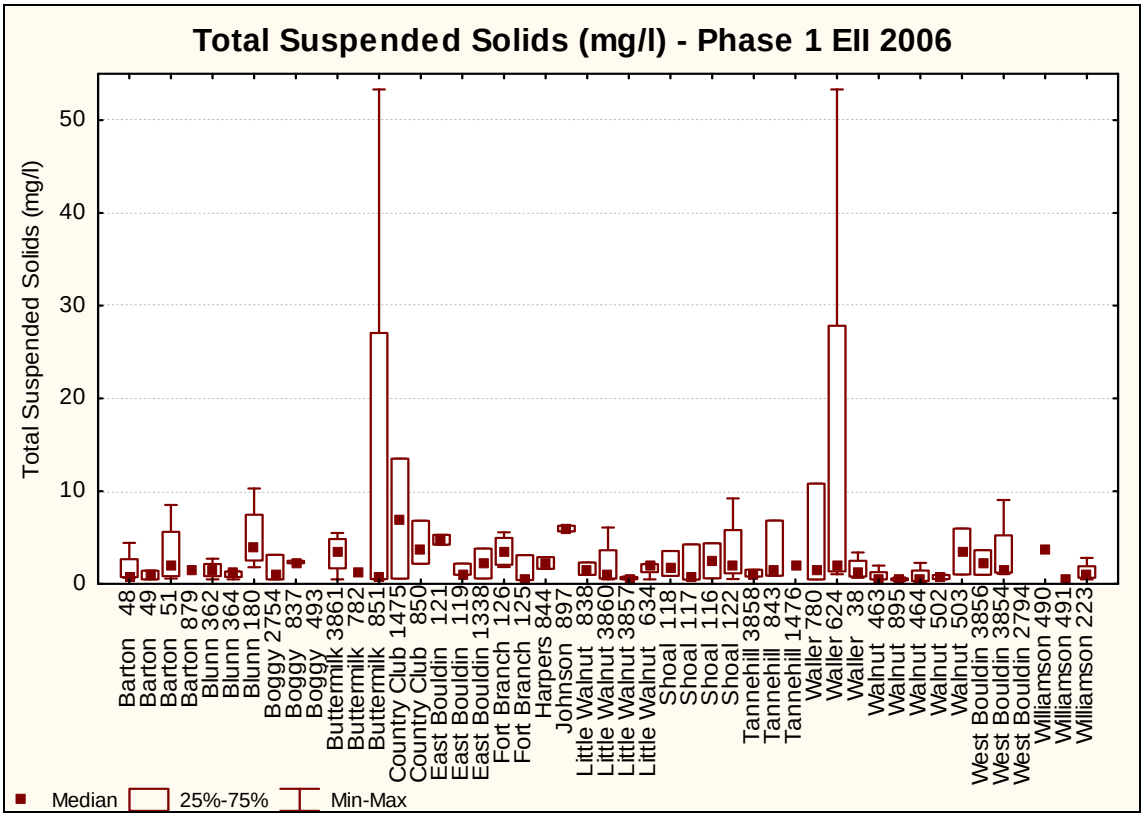


Figure 4h. Turbidity data from quarterly samples collected at phase 1 sites during 2006

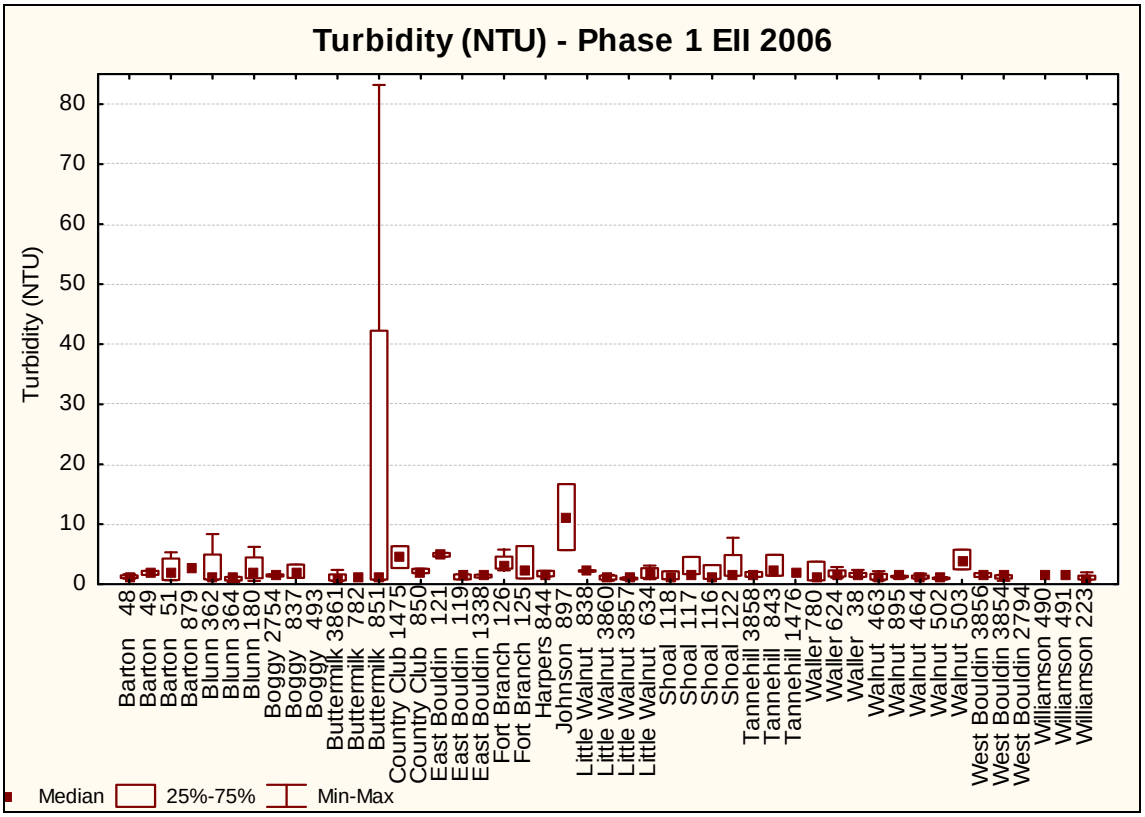


Figure 4i. Sulfate data from quarterly samples collected at phase 1 sites during 2006

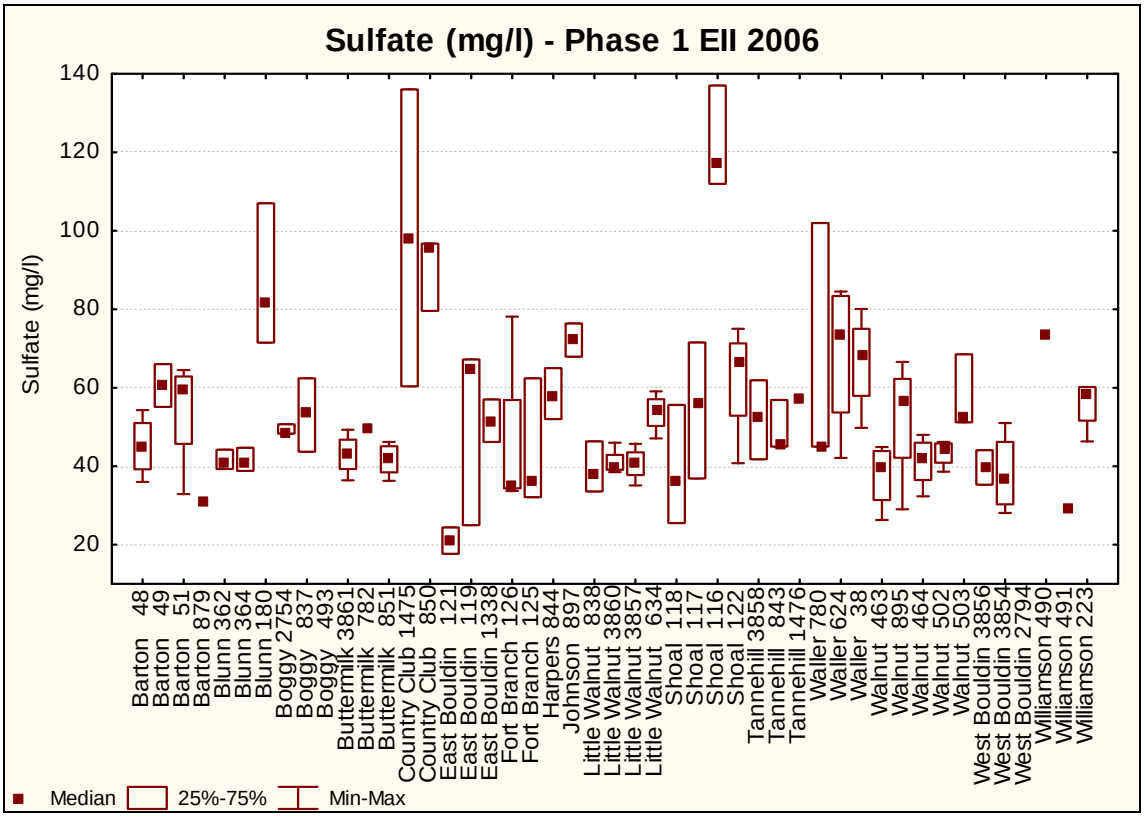
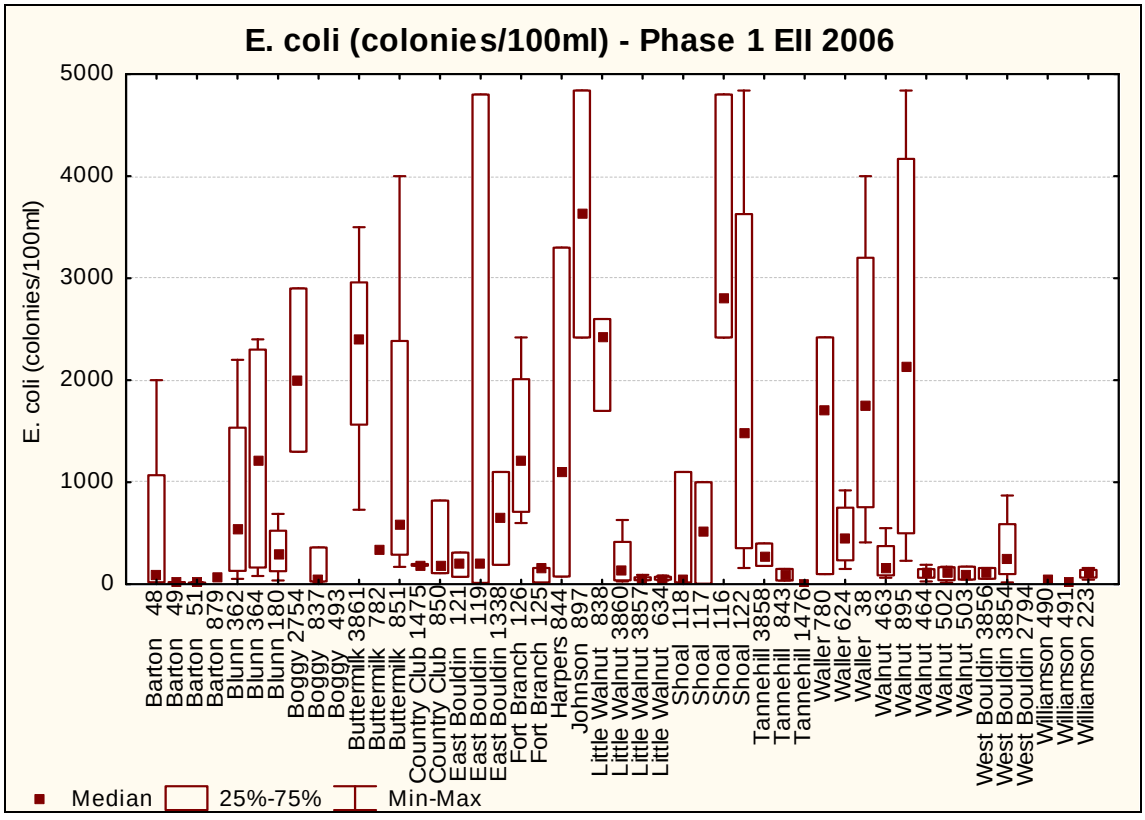


Figure 4j. Bacteria data from quarterly samples collected at phase 1 sites during 2006



Watershed Summaries

The following sections present a thorough review of each Phase 1 watershed in alphabetical order (Barton through Williamson). Each watershed section is six pages in length and includes a summary sheet (1), a land use map (2), an aerial photograph map (3) and data summary graphs for chemical parameters (4). The summary sheet (1) includes a brief fact list describing the physical characteristics of the watershed, demographics and land use. An overview map is located at the top of the page which shows the Phase 1 watersheds in purple with the featured watershed highlighted in yellow. The flow regime for all sites in the watershed as recorded during the 2003 and 2006 Phase 1 sampling events is presented in the middle of the page. Blue fields indicate the presence of baseflow while grey fields indicate no-flow (intermittent pools may have been present under no-flow conditions). A blank indicates that a site was not visited on the date indicated. A table with an overview of the physicochemical, nutrient, sediment and biological data from the 2006 sampling events is located in the middle of the summary sheet. The mean, minimum and maximum values for each parameter are presented with comments that compare overall values to the average scores for the 2006 sampling event. Parameter results are described as being "low" if they fall within the lower 25% of all values for the year, and "high" if they are above the 75th percentile for the year. Results that fell within 25th to 75th percentiles are described as being "average" unless the data indicates that a majority of the values fell above or below the 50th percentile, in which case, they are described as "above average" or "below average," respectively. A summary paragraph of the salient aspects of the 2006 sampling results can be found below the overview table. EII sub-index and total site scores for 2000, 2003 and 2006 are presented at the bottom of the page. The land use map (2) shows the site locations of the 2000, 2003 and 2006 sampling sites within the featured watershed. Watersheds are color coded to reflect land use designations as determined by 2003 COA data. A brief discussion regarding land use, development and topography of the watershed is included. The 2003 aerial photograph (3) has site locations, park boundaries, TCEQ permitted discharge locations, and known spring locations. Thumbnail photographs of most of the sites are included at the bottom of the page. Photographs for each site were selected from the archives based on their ability to represent the characteristics of the site, regardless of date, although there was a preference for the most current photograph. The date on which the photograph was taken is provided. Chemical parameters data summary graphs of all sites within the watershed (4) are the final three pages of each watershed summary. Graphs are clustered in three groups; field, nutrient and physical parameters.

Monitoring stream reach boundaries are also indicated on the aerial photograph for each of the watersheds. The monitoring reach boundaries for Phase 1 were designated during 2006 to facilitate water quality analysis by the Watershed Modeling and Analysis team while still providing the Surfacewater Monitoring team the flexibility to move site locations as needed. Reach boundaries were determined based on similarities in landuse, hydrology, development and geomorphology. Table 3 shows the basis for reach boundary placement and the 2006 sites which represent each reach.

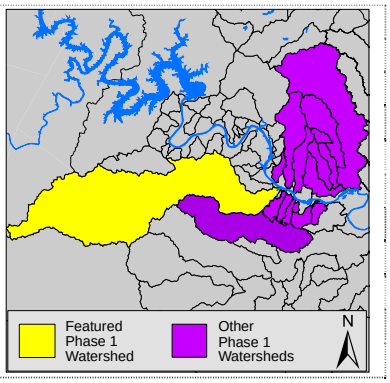
Table 3. EII Reach Designations for each of the phase I watersheds

Watershed	Reach ID	2006 EII Site to Represent Reach		Basis for placement of boundaries				
				WMA	RGA / Geomorph	2003 Landuse	Future Dev. or Current Impact	Hydrology
Barton	BAR1	879	Between Dams Above Pool	x	x			x
	BAR2	88	350m Downstream of Lost Creek Blvd		x	x	x	
	BAR3	49	at Ogletree Pool		x	x	x	
	BAR4	48	at Hwy 71 Below Little Barton			x	x	
	BAR5	no sampling				x	x	
Blunn	BLU1	180	at Riverside Drive		x			
	BLU2	364	above Big Stacy Pool	x	x	x		
	BLU3	362	at Long Bow (Preserve at Little		x	x		
Buttermilk	BMK1	851	at Little Walnut Creek		x	x		
	BMK2	782	at Providence Ave		x	x		
	BMK3	3861	at Victory Christian Center	x	x	x		
Boggy	BOG1	493	at Delwau Lane		x			
	BOG2	837	at Nile Street	x	x			
	BOG3	2754	at Manor Rd		x			
Country Club	ECC1	1475	East Country Club @ ACC	x		x		
	WCC1	1474	West Country Club @ Krieg Fields			x		
	WCC2	850	West Country Club Creek @ E. Oltorf	x		x		
East Bouldin	EBO1	1338	at Post Oak	x	x			
	EBO2	119	at Elizabeth St		x	x		
	EBO3	121	Downstream of W. Alpine Rd			x		
Fort Branch	FOR1	123	at North Boggy		x			
	FOR2	898	at Carson Hill Rd			x		
	FOR3	125	above Manor Rd	x		x		
	FOR4	126	at Glencrest			x		
Harpers	HRP1	844	at Woodland Ave	x	x	x	x	
Johnson	JOH1	897	at Woodmont Avenue		x	x		x
Little Walnut	LWA1	634	at US183	x		x		x
	LWA2	3857	at Cameron Rd		x	x		
	LWA3	3860	upstream IH35			x		
	LWA4	838	at Golden Meadow Rd			x		
Shoal	SHL1	122	above 1st St.			x		
	SHL2	116	at 24th Street		x	x		
	SHL3	117	at Shoal Edge Court	x		x		x
	SHL4	118	downstream of Crosscreek Dr			x		
Tannehill	TAN1	1476	at Desirable Drive	x	x	x		
	TAN2	843	at Lovell Drive			x	x	
	TAN3	3858	at Berkman Dr	x		x		
West Bouldin	WBO1	2794	at Post Oak	x	x			
	WBO2	3854	at Oltorf Street		x		x	
	WBO3	3856	at Cardinal & Locke			x		
Waller	WLR1	38	below Cesar Chavez			x		
	WLR2	624	upstream of 23rd Street			x		
	WLR3	780	at 51st Street	x		x		
Walnut	WLN1	503	at SP Railroad Bridge					x
	WLN2	502	at Old Manor Road			x		
	WLN3	464	below IH35				x	x
	WLN4	895	at Metric Blvd	x		x		
	WLN5	463	Wells Branch at Wln Metro Park	x				x
Williamson	WMS1	223	at McKinney Falls	x		x		x
	WMS2	491	at IH35			x		x
	WMS3	490	at Hwy 71			x		x

Barton Creek Watershed

Summary Sheet

Catchment	Total area	108.7 square miles	
	Area in recharge	7.8 square miles	
	Creek length	49.5 miles	
	Receiving water	Town Lake	
Demographics	2000 population	1,159,543	
	2030 projected population	2,749,995	
	30 year projected % increase	137%	
Land Use	Impervious cover ('97 crwr data)	3.9 %	
Overall EII Scores	2000	77	
	2003	87	
	2006	75	



Flow Regime* for Sample Sites on Barton Creek Upstream to Downstream

		2003					2006				
		Feb	Mar	May	Sep	Dec	Feb	May	Jul	Aug	Nov
		19	10-17	14	23	3	22	18	5-12	23	29
Site #	Site Name	WQ	Bio	WQ	WQ	WQ	WQ	WQ	Bio	WQ	WQ
48	Barton at Hwy 71 Below Little Barton	B	B	B	B	B	B	B	B	B	B
49	Barton at Ogletree Pool	B	B	B	B	n	B	*	B	B	*
88	Barton 350m downstream of Lost Creek	B	B	B	B	B					
51	Barton downstream of Lost Creek						B	B	B	B	B
879	Barton Between Dams Above Pool	B	B	B	B	n	n	B	n	n	n

* B = baseflow conditions n = no flow was present Storm = storm flow was present
Blue = Samples were taken Grey = Samples were not taken Blank = site not visited

	Parameter	Mean	Max	Min	Relative concentrations compared to other 2006 Phase 1 watersheds
Physicochemical	**D.O.** mg/l	6.5	8.1	4.1	Average[1] w/ some below average values at Site 51 and 48 in Aug and Nov
	pH st.units	7.54	7.96	7.03	Sites 51 and 879 below average, decreasing trend downstream
	Cond uS/cm	666	770	557	Average[1]
	SO_4 mg/l	49.9	66.0	30.8	Average[1]
Nutrients	**NH_3** mg/l	0.03	0.08	0.01	Site 51 above average concentrations, other sites average[1]
	NO_3 mg/l	0.21	0.71	0.02	Average[1]
	Ortho P mg/l	0.03	0.06	0.02	Average[1]
Sediment Load	**TSS** mg/l	2.1	8.5	0.5	Site 51 w/ some above average concentrations, other sites average[1]
	Turbidity ntu	2.0	5.3	0.7	Site 51 w/ some above average concentrations, other sites average[1]
Biology	**E.Coli** /100ml	212	2,000	2	Very low at all sites with the exception of one high concentration at Site 48
	Benthic Macs	Most diverse taxa and highest EPT and ALU scores than any other watershed. Site 49 was the best 2006 site			
	Diatoms	Most scores above average in quality with consistent high *Cymbella* richness			

[1] values for this parameter are similar to the median scores for the other 2006 Phase 1 watersheds

Discussion: Although site 879 (Barton between dams above pool) was dry for a significant portion of the year, most sites maintained superior aquatic integrity compared to the other Phase I sites. The subindex and overall EII site score for Site 879 was depressed due to lack of flow. There appears to be a downstream decreasing trend in pH and an increasing trend in nutrients. Site 51 appears to consistently have higher nutrients than the rest of the Barton sites. See SR-07-09 for more detailed information on the status of Barton Creek water quality.

Sub-index scores for Barton Creek Sites (upstream to downstream) 2000, 2003, 2006

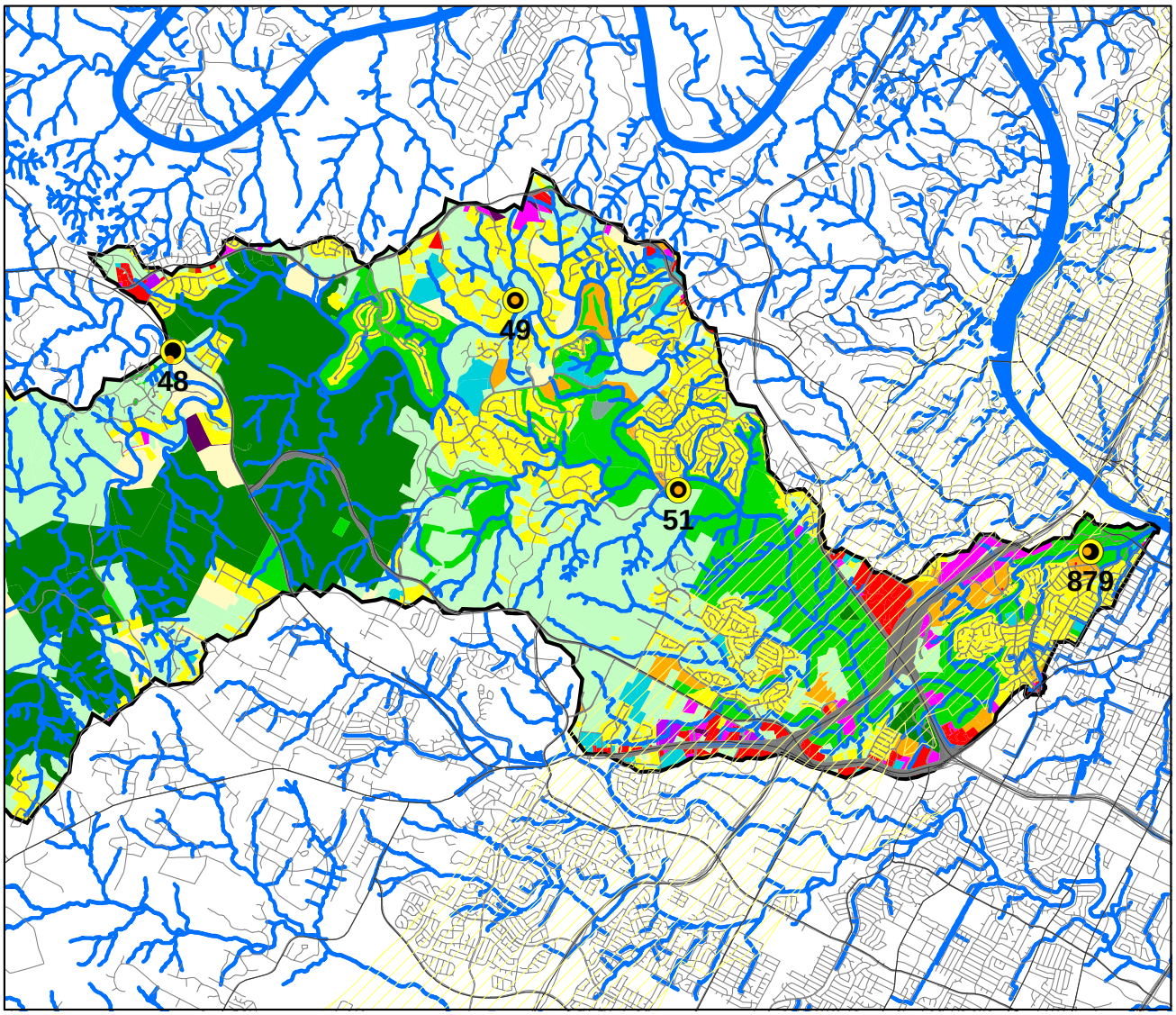
Site Number	Site 48			Site 49			Site 88			Site 51			Site 879		
Year of Sampling	2000	2003	2006	2000	2003	2006	2000	2003	2006	2000	2003	2006	2000	2003	2006
Water Quality		82	73	73	84	73	70	75				59		62	68
Sediment		70	75	65	70	75	65	70				75		70	75
Contact Recreation		95	62	97	99	91	91	97				93		92	50
Non-Contact Rec.		98	92	90	99	91	74	93				82		96	60
Physical Integrity		88	80	62	92	88	61	95				86		81	62
Aquatic Life		94	98	84	89	97	91	81				88		100	
Benthic Mac.		87	96	76	84	96	81	72				81		100	
Diatom		100	99	91	93	97	100	90				94		100	
Total EII Score		88	80	79	89	86	75	85				81		84	53

* sediment samples only collected at the downstream site, blank cells indicate parameter was not collected, blank columns indicate site was dropped

100-87.5 Excellent 87.5-75 V. Good 75-62.5 Good 62.5-50 Fair 50-37.5 Marginal 37.5-25 Poor 25-12.5 Bad 12.5-0 V. Bad

Barton Creek Watershed

Land Use Map



0 2.5 5 Miles

N

Landuse Coverage Based on 2003 Data

Barton Creek Watershed

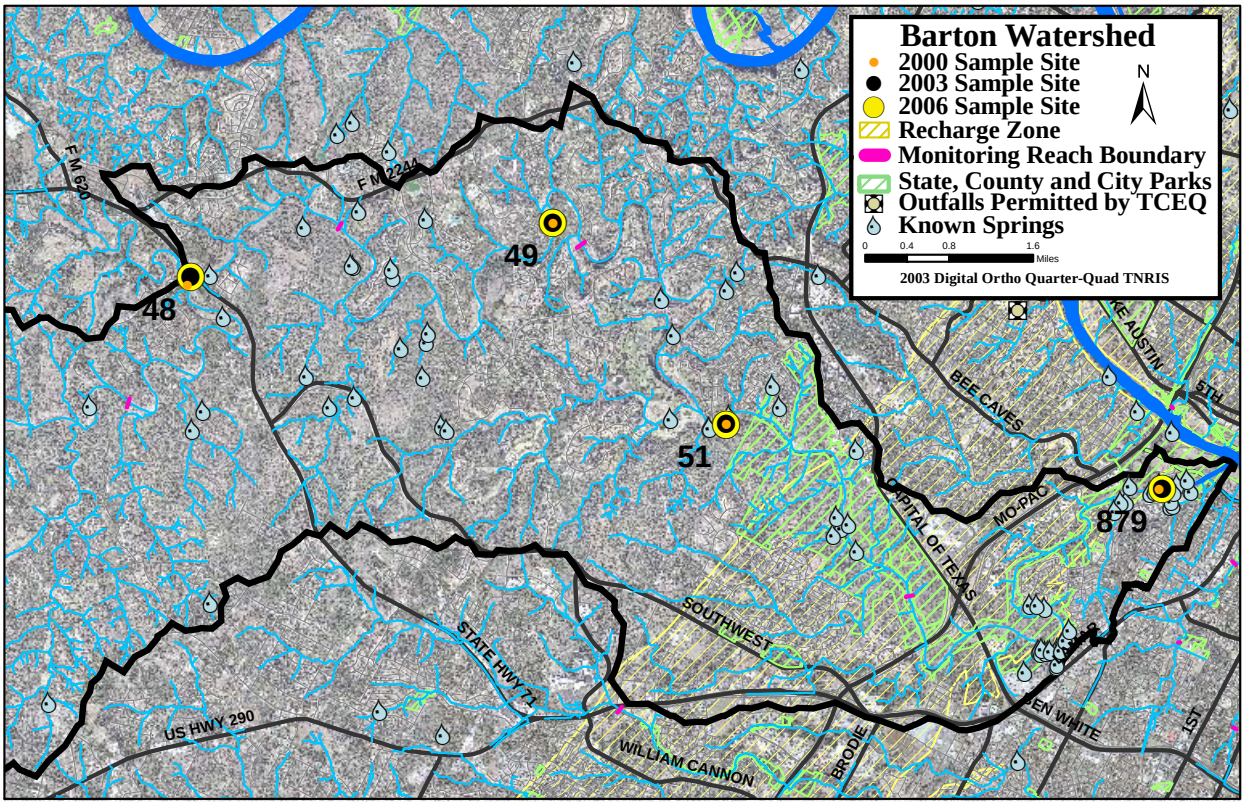
- 2000 Sample Site
- 2003 Sample Site
- 2006 Sample Site
- Recharge Zone
- Major Roads
- Creeks
- Single-Family
- Large Lot Single-Family
- Multi-family
- Commercial
- Office
- Industrial
- Mining / Landfill
- Civic
- Golf Course / Agricultural
- Open / Parks / Undeveloped
- Wildlife Preserve
- Transportation / Utilities

Land Use and Development:

The Barton Creek watershed is over three times the size of all other watersheds which drain into Town Lake. It has the lowest amount of impervious cover of the Phase1 watersheds and the landuse is similar to suburban and rural watersheds of the Austin area. Eight square miles of the watershed are in the Edwards Aquifer Recharge Zone where water travels through caves and sinkholes to "recharge" the aquifer; another 112 square miles are in the contributing zone, where water travels over land to the creeks of the recharge zone. Well known sites include the city's longest greenbelt trail system is located along Barton Creek and the new AMD location. Although conservation easements and acquisitions preserving undeveloped land will contribute to protection of water quality interests, rapid development in the western half of the watershed threatens to harm it.

Barton Creek Watershed

Aerial Map



48 Barton at Hwy 71 Below Little Barton 07/07/2006

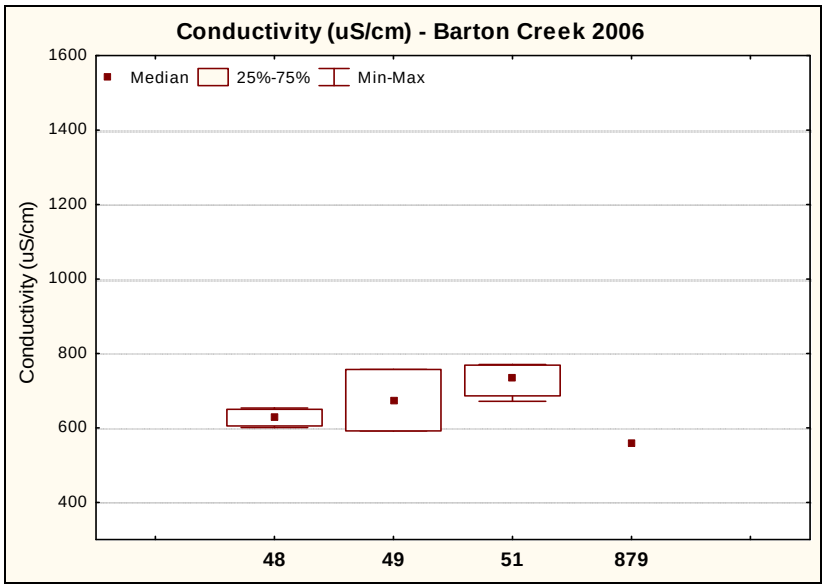
49 Barton at Ogletree Pool 03/17/2003

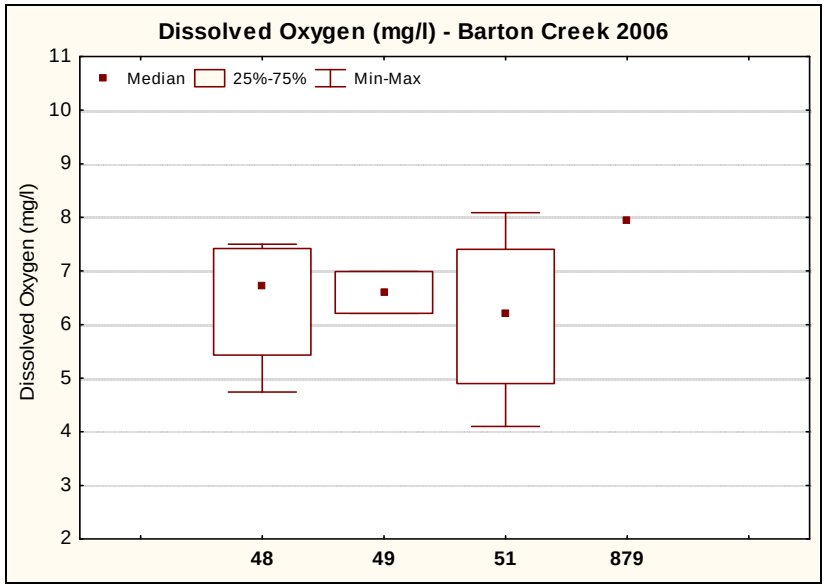
51 Barton Downstream of Lost Creek 07/07/2006

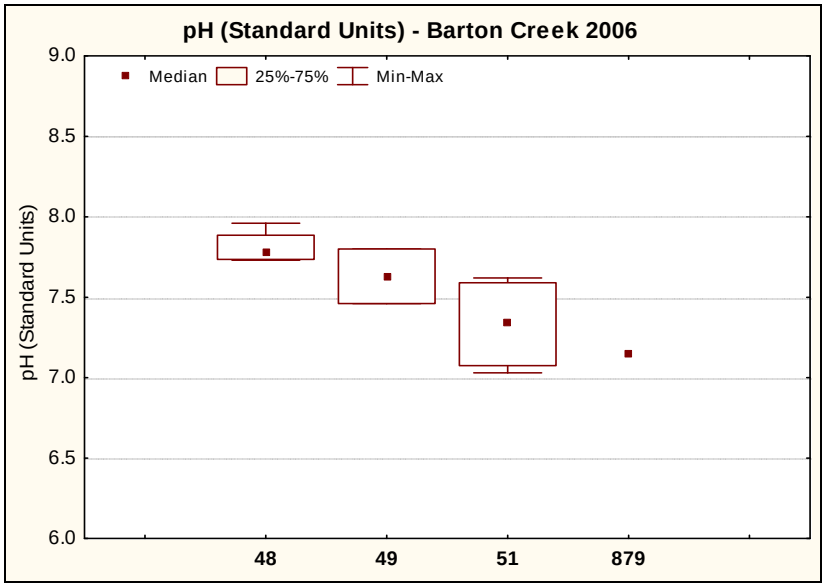
79 Barton Between Dams Above Pool 07/06/2006

Barton Creek Watershed

Data Summary Graphs - Field Parameters

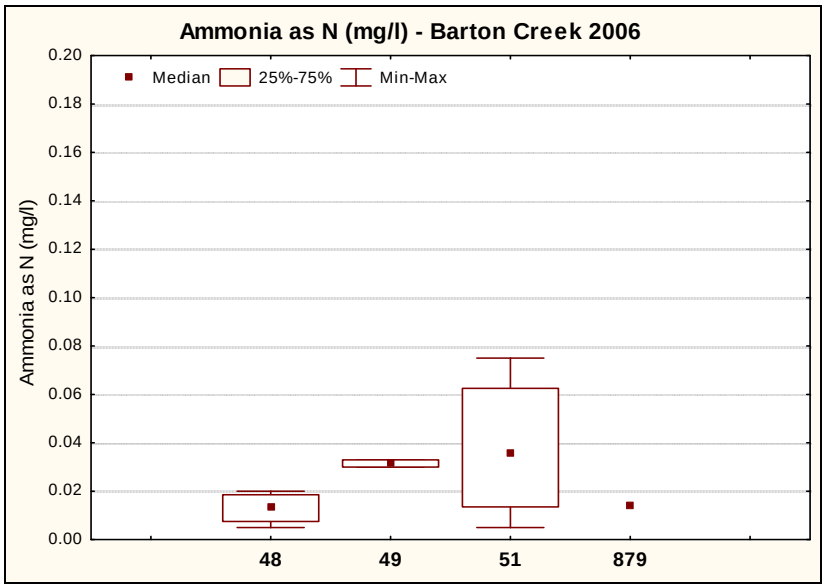


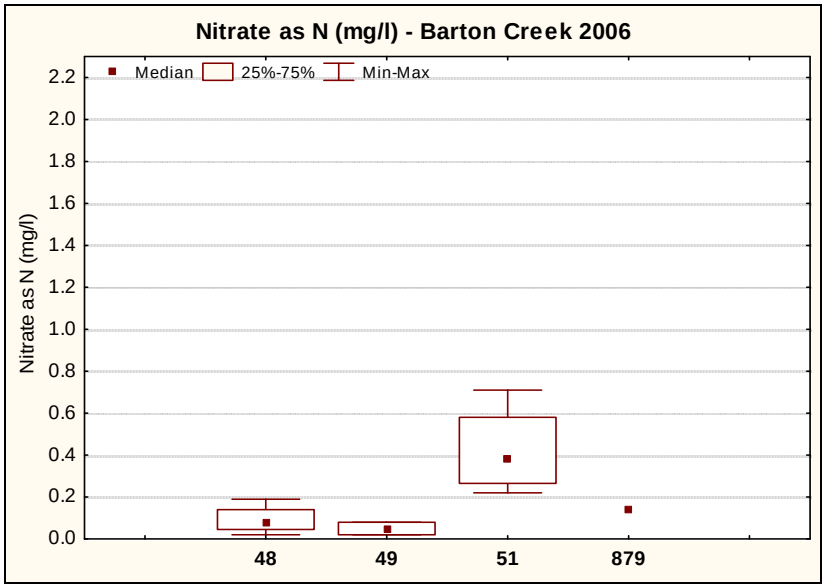


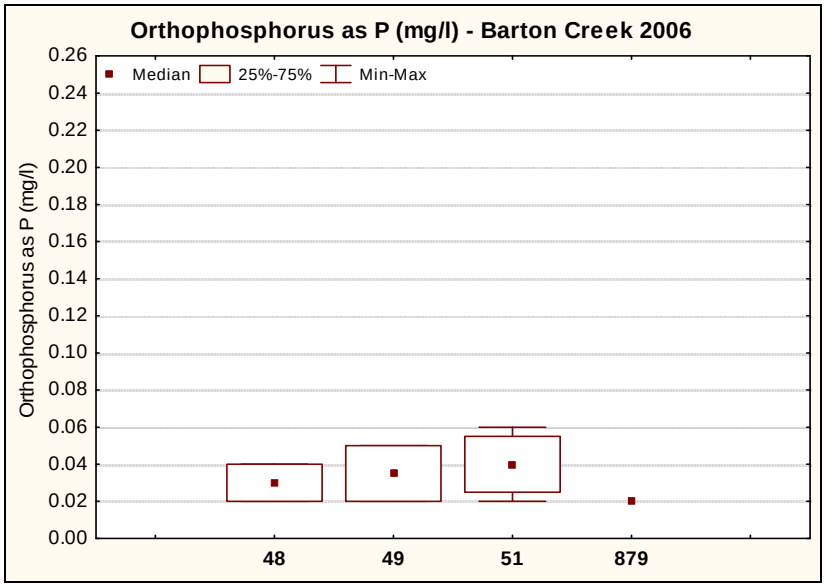


Barton Creek Watershed

Data Summary Graphs - Nutrients

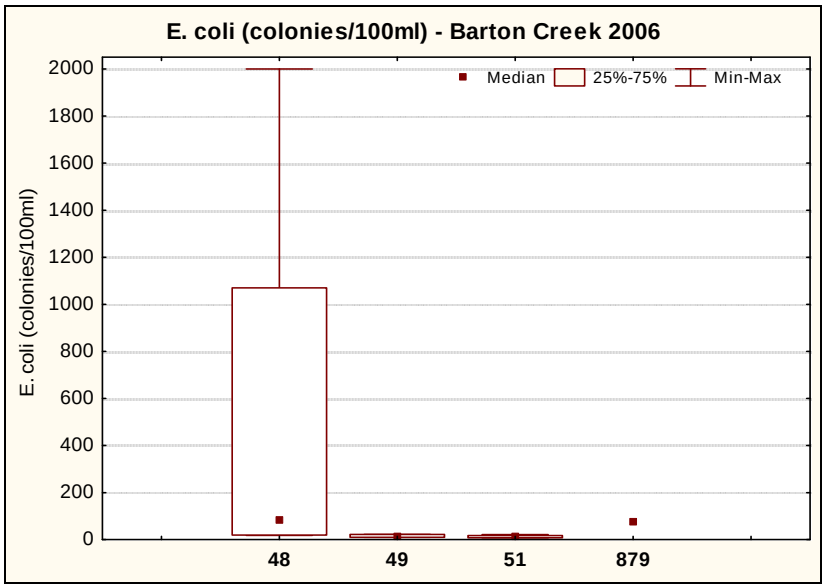


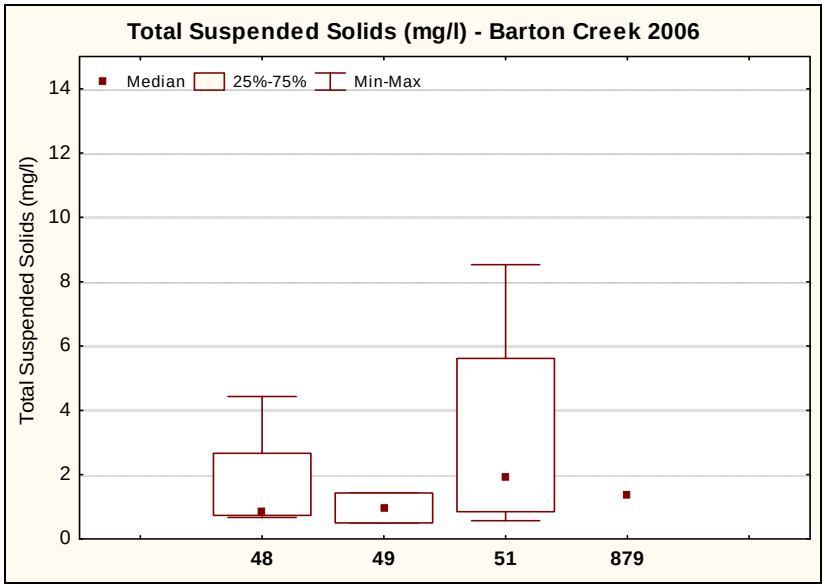


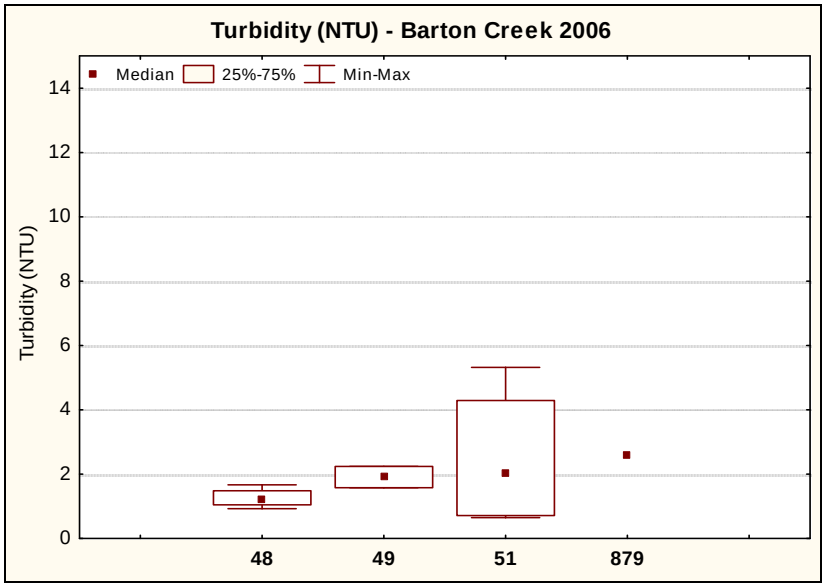


Barton Creek Watershed

Data Summary Graphs – Physical Parameters



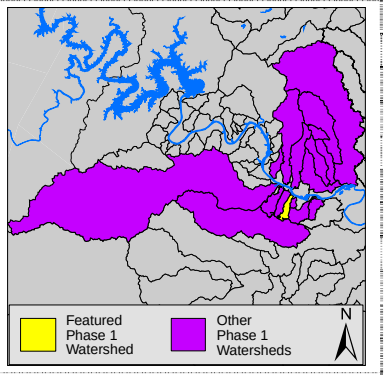




Blunn Creek Watershed

Summary Sheet

Catchment	Total area	1 square mile
	Area in recharge	none
	Creek length	3 miles
	Receiving water	Town Lake
Demographics	2000 population	6,000
	2030 projected population	6,810
	30 year projected % increase	14 %
Land Use	Impervious cover ('97 crwr data)	38.3 %
Overall EII Scores	2000	57
	2003	61
	2006	61



Flow Regime* for Sample Sites on Blunn Creek Upstream to Downstream

		2003					2006				
		Feb	Mar	May	Sep	Dec	Feb	May	Jul	Aug	Nov
		19	10-17	14	23	3	22	18	5-12	23	29
Site #	Site Name	WQ	Bio	WQ	WQ	WQ	WQ	WQ	Bio	WQ	WQ
362	Blunn at Longbow	B	B	B	B	B	B	B	B	B	B
364	Blunn above Big Stacy Pool	B	B	B	B	B	B	B	B	B	B
180	Blunn above Riverside Drive	B	B	B	B	B	B	B	B	B	B

* B = baseflow conditions n = no flow was present Storm = storm flow was present
Blue = Samples were taken Grey = Samples were not taken Blank = site not visited

	Parameter	Mean	Max	Min	Relative concentrations compared to other 2006 Phase 1 watersheds
Physicochemical	**D.O.** mg/l	6.2	9.2	1.9	All sites low in Aug and Nov, but average in Feb and may
	pH st.units	7.47	7.88	6.74	Below average at Sites 364 and 180, average at Site 362
	Cond uS/cm	732	1,155	183	High at Site 180, one low value at Site 364, and average[1] at Site 362
	SO_4 mg/l	56.5	107.0	38.8	High at Site 180, other sites average[1]
Nutrients	**NH_3** mg/l	0.07	0.63	0.01	Above avg. concentrations at all sites in Aug, avg[1] during other events
	NO_3 mg/l	0.59	2.13	0.02	Above average consistently at Site 364, other sites average[1]
	Ortho P mg/l	0.12	0.42	0.04	Above average with some high concentrations downstream
Sediment Load	**TSS** mg/l	2.5	10.3	0.5	Above average at Site 180, other sites average[1]
	Turbidity ntu	2.2	8.4	0.4	Typically average w/ occasional high concentrations at Sites 180 & 362
Biology	**E.Coli** /100ml	780	2,400	37	Above average at Site 364 and 362
	Benthic Macs	Despite low EPT and low numbers of intolerant taxa, most sites scored average[1]			
	Diatoms	Site 362 scored consistently above average on most metrics, while Sites 180 and 364 were average[1]			

[1] values for this parameter are similar to the median scores for the other 2006 Phase 1 watersheds

Discussion: Baseflow is reliable in this spring-fed stream. Bacteria levels and nutrients are above average compared to other 2006 watersheds potentially indicating declining integrity of the aging wastewater lines or other fecal contamination. Although the 2006 overall scores are slightly better than the 2000 scores, aquatic integrity does not appear to be improving significantly.

Sub-index scores for Blunn Creek Sites (upstream to downstream) 2000, 2003, 2006

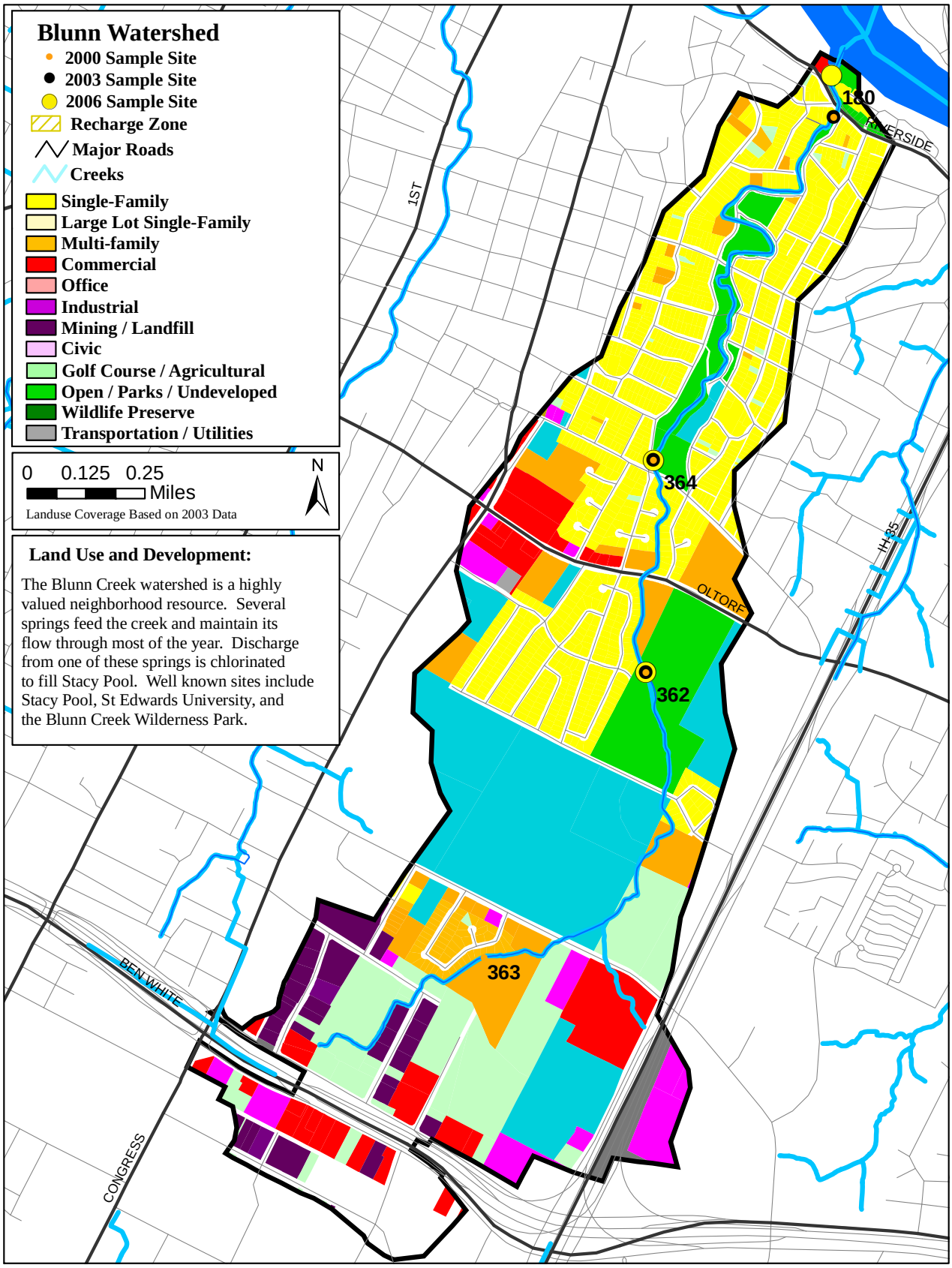
Site Number	Site 362			Site 364			Site 180		
Year of Sampling	2000	2003	2006	2000	2003	2006	2000	2003	2006
Water Quality	47	49	55	51	51	52	49	47	47
Sediment	69	71	67	69	71	67	69	71	67
Contact Recreation	78	66	39	80	48	35	45	73	44
Non-Contact Rec.	73	86	94	68	72	73	66	63	79
Physical Integrity	47	85	79	41	47	72	40	67	51
Aquatic Life	44	46	70	55	40	57	31	37	60
Benthic Mac.	29	54	53	35	43	44	31	44	45
Diatom	58	37	87	74	37	70	31	30	74
Total EII Score	60	67	67	61	55	59	50	60	58

* sediment samples only collected at the downstream site, blank cells indicate parameter was not collected, blank columns indicate site was dropped

100-87.5 Excellent 87.5-75 V. Good 75-62.5 Good 62.5-50 Fair 50-37.5 Marginal 37.5-25 Poor 25-12.5 Bad 12.5-0 V. Bad

Blunn Creek Watershed

Land Use Map



Blunn Creek Watershed

Aerial Map

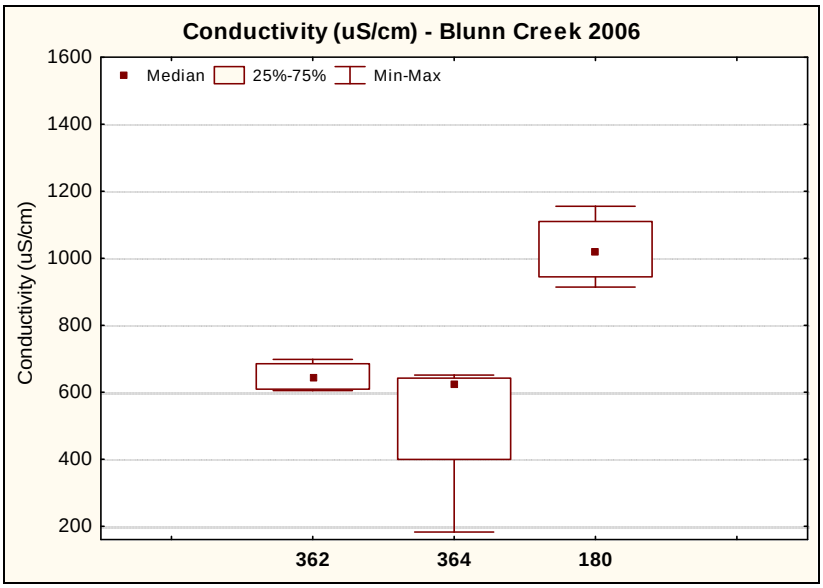
180 Blunn above Riverside Drive 02/22/2001

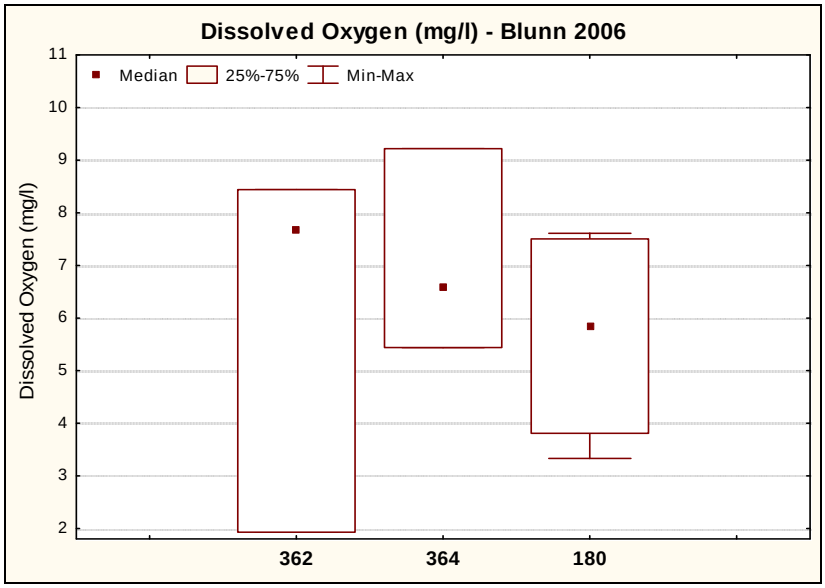
364 Blunn above Big Stacy Pool 07/05/2006

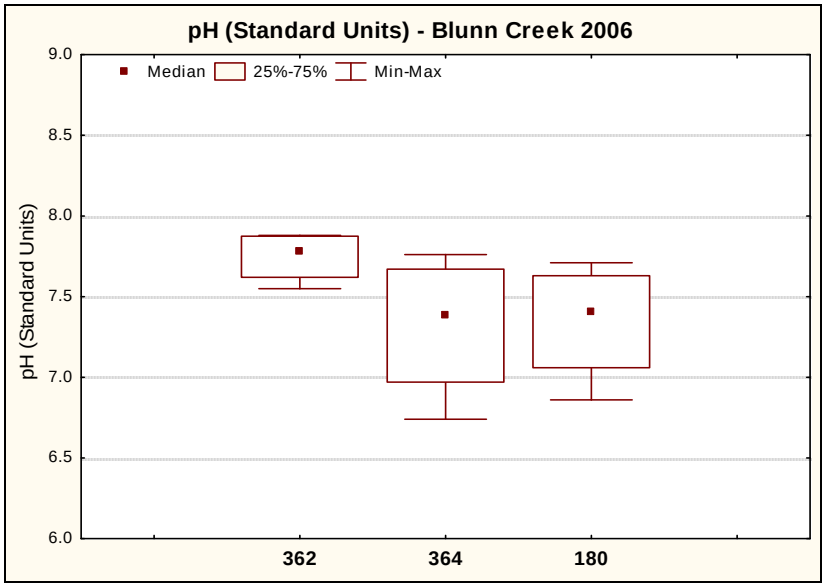
362 Blunn at Longbow 07/11/2006

Blunn Creek Watershed

Data Summary Graphs - Field Parameters

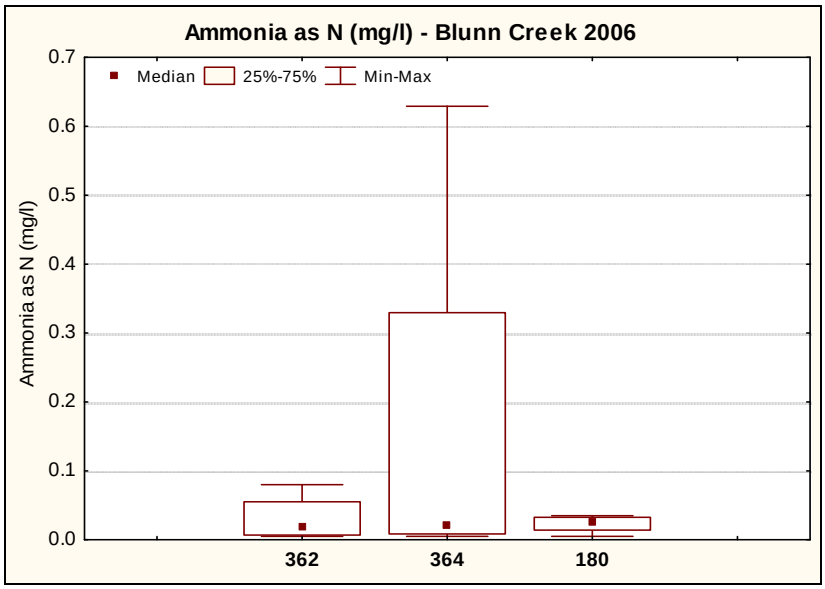


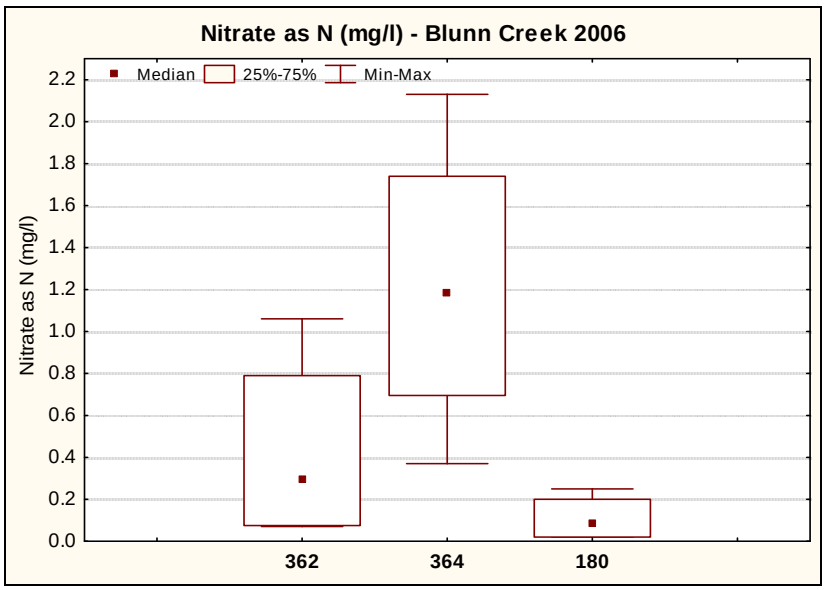


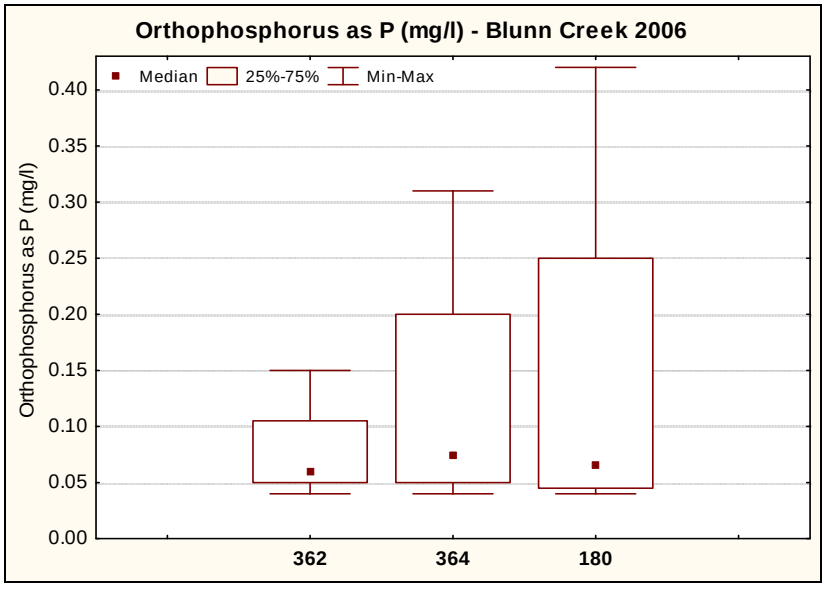


Blunn Creek Watershed

Data Summary Graphs - Nutrients

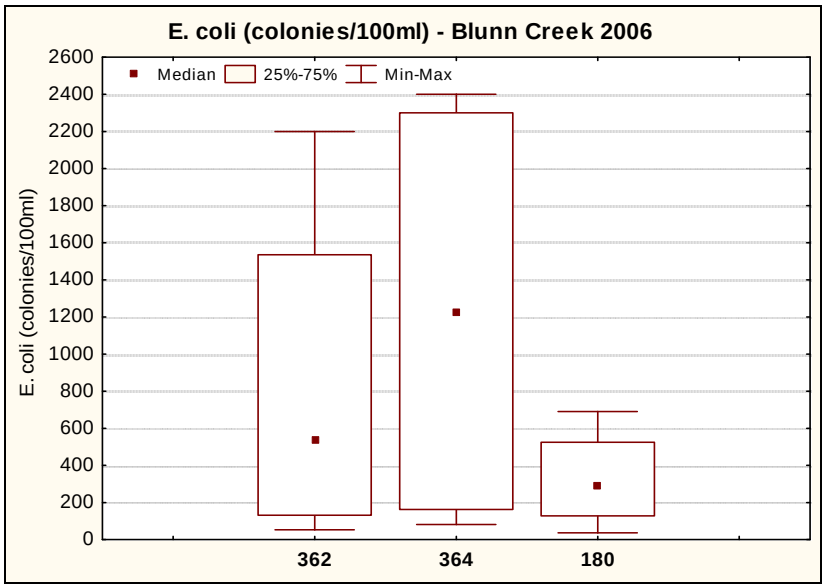


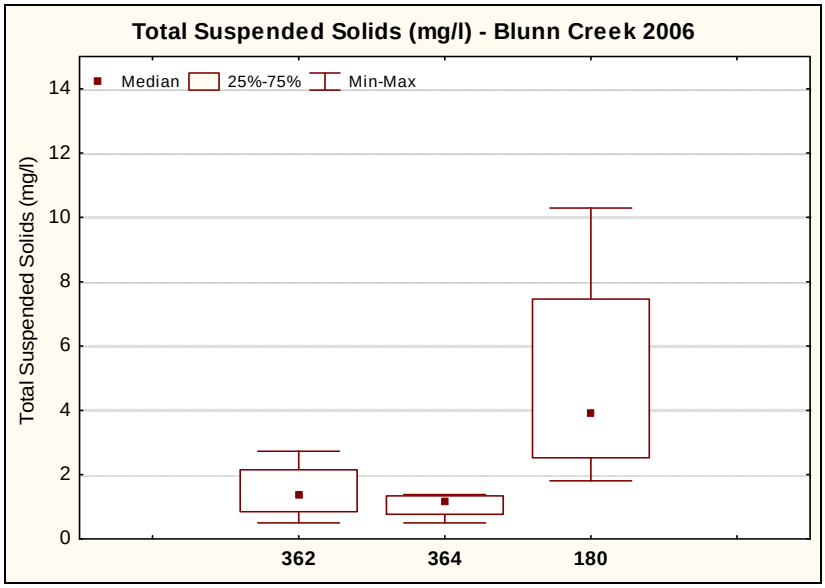


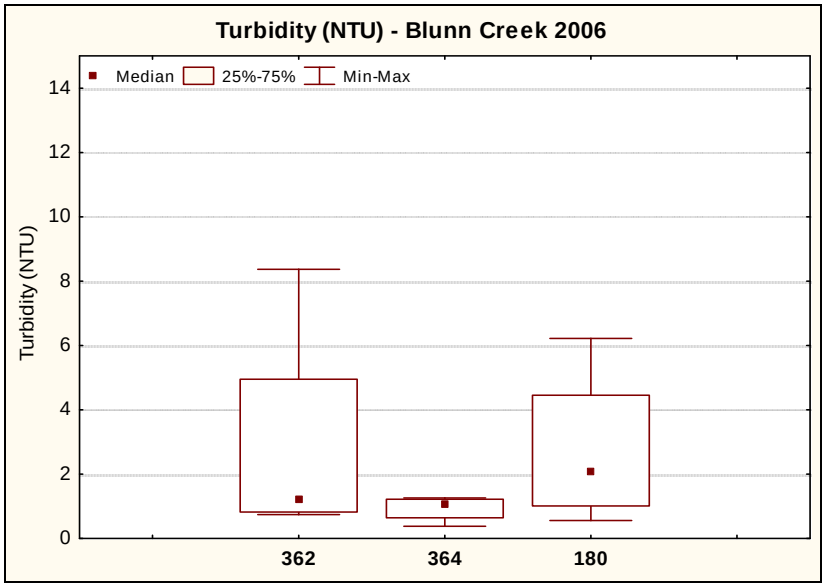


Blunn Creek Watershed

Data Summary Graphs - Physical Parameters



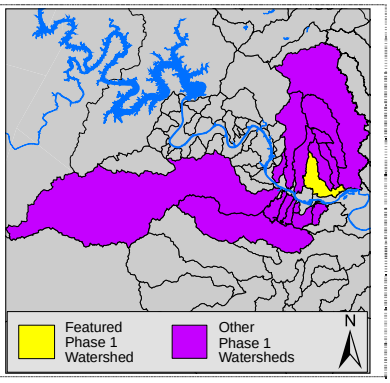




Boggy Creek Watershed

Summary Sheet

Catchment	Total area	6 square miles
	Area in recharge	none
	Creek length	8 miles
	Receiving water	Colorado River
Demographics	2000 population	23,372
	2030 projected population	35,728
	30 year projected % increase	53 %
Land Use	Impervious cover ('97 crwr data)	41.7 %
Overall EII Scores	2000	56
	2003	58
	2006	57



Flow Regime* for Sample Sites on Boggy Creek Upstream to Downstream

		2003					2006				
		Feb	Mar	May	Sep	Dec	Feb	May	Jul	Aug	Nov
		19	10-17	14	23	3	22	18	5-12	23	29
Site #	Site Name	WQ	Bio	WQ	WQ	WQ	WQ	WQ	Bio	WQ	WQ
2754	North Boggy at Manor	B	B	B	B	B	B	B	B	n	B
837	North Boggy at Nile Street	B	B	B	B	B	B	B	B	n	B
493	North Boggy at Delwau Lane	B	B	B	B	n	n	n	B	n	n

* B = baseflow conditions n = no flow was present Storm = storm flow was present
Blue = Samples were taken Grey = Samples were not taken Blank = site not visited

	Parameter	Mean	Max	Min	Relative concentrations compared to other 2006 Phase 1 watersheds
Physicochemical	**D.O.** mg/l	6.7	10.0	2.7	Below average at Site 2754, average[1] at Site 837
	pH st.units	7.6	7.9	7.3	Average[1]
	Cond uS/cm	703	776	562	Average[1]
	SO_4 mg/l	51.2	62.4	43.7	Average[1]
Nutrients	**NH_3** mg/l	0.03	0.05	0.01	Average[1]
	NO_3 mg/l	0.15	0.61	0.02	Average[1]
	Ortho P mg/l	0.10	0.16	0.06	Above average concentrations at Sites 2754 and 837
Sediment Load	**TSS** mg/l	2.0	3.1	0.5	Average[1]
	Turbidity ntu	1.8	3.3	1.1	Average[1] at Site 2754, occasionally above average at Site 837
Biology	**E.Coli** /100ml	1,104	2,900	27	Above average at Site 2754, average[1] at 837
	Benthic Macs	Below average for most metrics. Site 2754 very low (1 EPT, 1 tolerant taxa, only 55 individuals in sample)			
	Diatoms	Although all sites showed excellent diversity, the *Cymbella* richness and % motile taxa were poor.			

[1] values for this parameter are similar to the median scores for the other 2006 Phase 1 watersheds

Discussion: Despite reliable baseflow at the upstream sites, the mouth site (493) is typically dry, due in part, to subsurface flow in significant alluvial deposition. Although several of the individual sub-index scores have improved since 2000, overall watershed scores have consistently remained in the "fair" category. Bacteria levels at Site 2754 are chronically elevated resulting in poor contact recreation scores.

Sub-index scores for Boggy Creek Sites (upstream to downstream) 2000, 2003, 2006

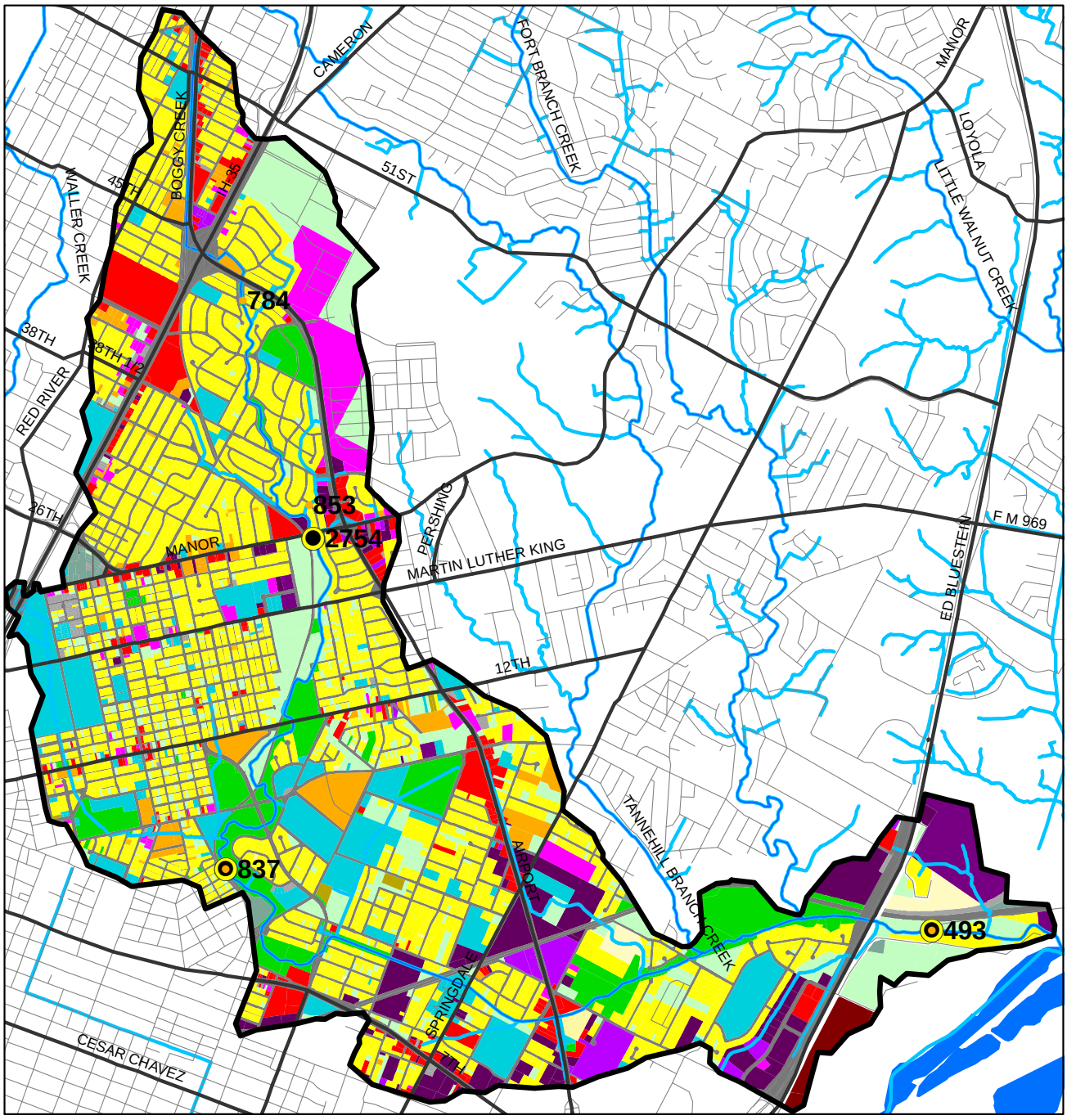
Site Number	Site 2754			Site 837			Site 493		
Year of Sampling	2000	2003	2006	2000	2003	2006	2000	2003	2006
Water Quality		51	52	62	52	57	67	67	
Sediment		88	85	88	88	85	88	88	85
Contact Recreation		45	25	78	62	65	82	82	
Non-Contact Rec.		56	63	62	75	66	79	58	71
Physical Integrity		54	48	20	47	51	23	47	36
Aquatic Life		26	38	23	26	52	30	37	50
Benthic Mac.		23	25	33	30	43	29	42	37
Diatom		28	51	13	22	61	31	31	62
Total EII Score		53	52	56	58	63	62	63	61

* sediment samples only collected at the downstream site, blank cells indicate parameter was not collected, blank columns indicate site was dropped

100-87.5 Excellent 87.5-75 V. Good 75-62.5 Good 62.5-50 Fair 50-37.5 Marginal 37.5-25 Poor 25-12.5 Bad 12.5-0 V. Bad

Boggy Creek Watershed

Land Use Map



Boggy Creek Watershed

- 2000 Sample Site
- 2003 Sample Site
- 2006 Sample Site
- Major Roads
- Creeks

N

0 0.25 0.5 Miles

Landuse Coverage Based on 2003 Data

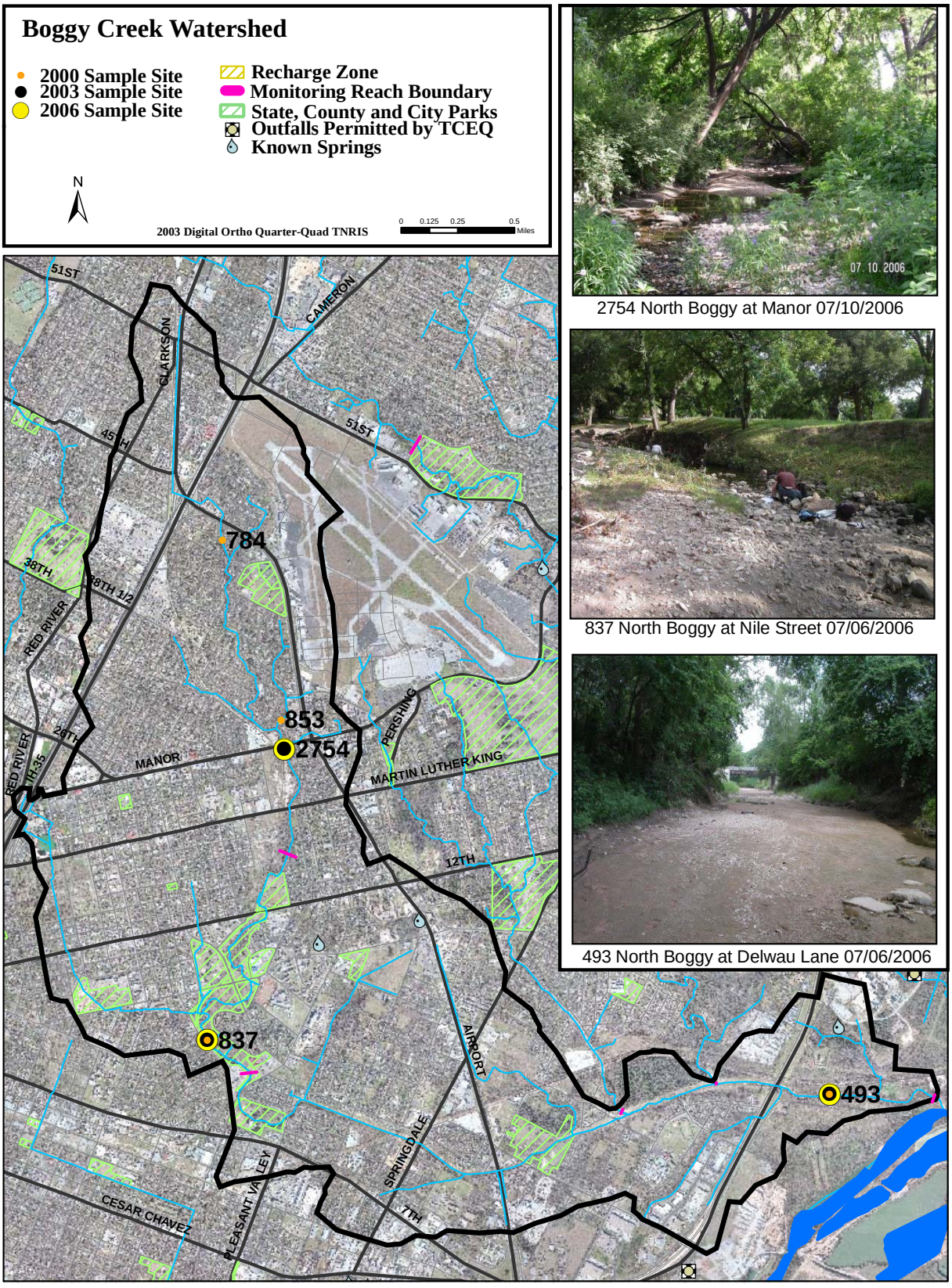
- Single-Family
- Large Lot Single-Family
- Multi-family
- Commercial
- Office
- Industrial
- Mining / Landfill
- Civic
- Golf Course / Agricultural
- Open / Parks / Undeveloped
- Wildlife Preserve
- Transportation / Utilities

Land Use and Development:

The Boggy Creek watershed is characterized by eroded banks with debris and trash in the creek channels. Several miles of Boggy Creek have been channelized with trapezoidal concrete channels

Boggy Creek Watershed

Aerial Map



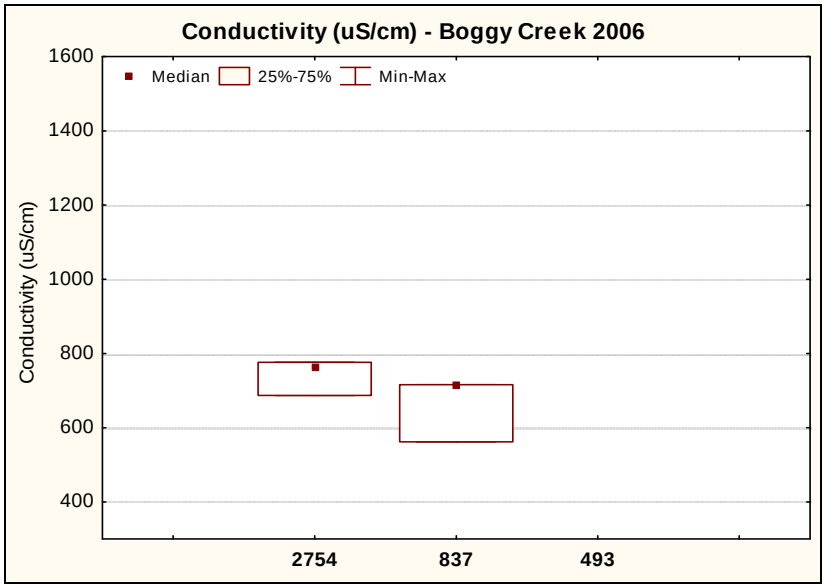
2754 North Boggy at Manor 07/10/2006

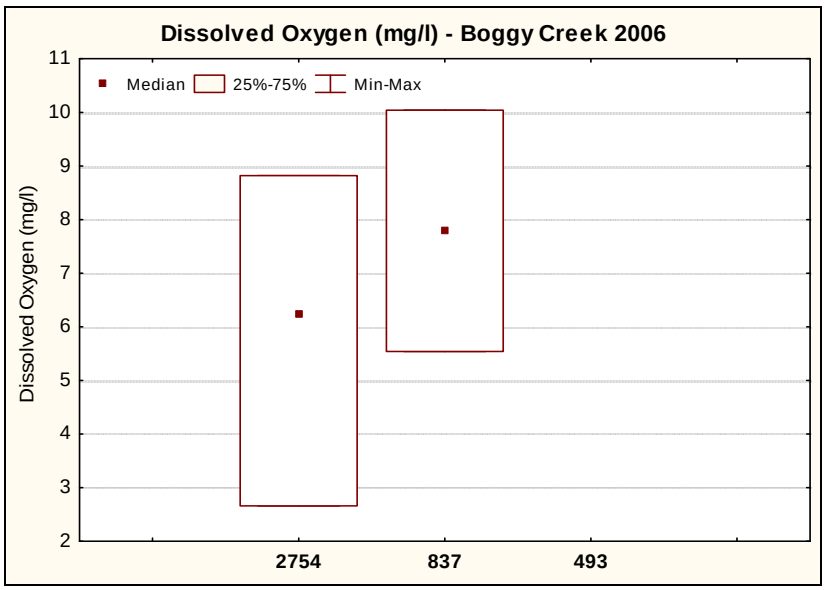
837 North Boggy at Nile Street 07/06/2006

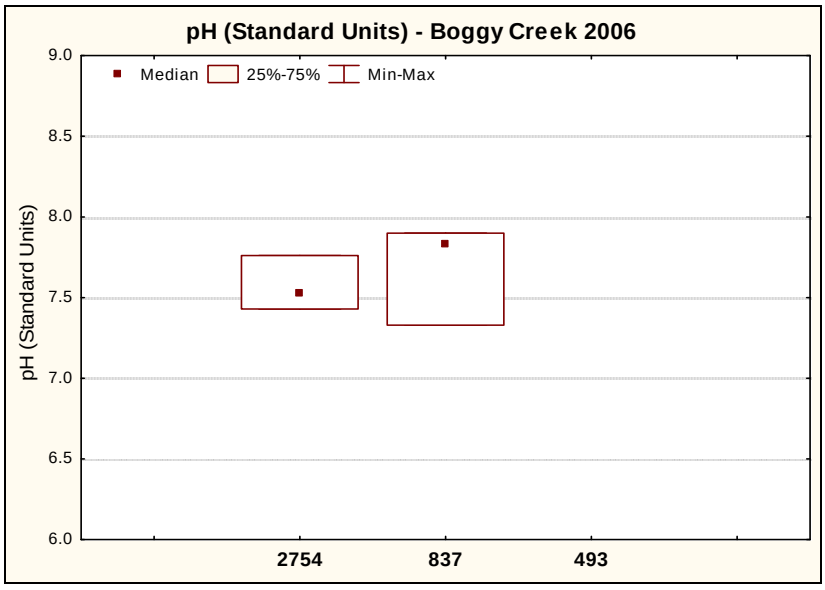
493 North Boggy at Delwau Lane 07/06/2006

Boggy Creek Watershed

Data Summary Graphs – Field Parameters

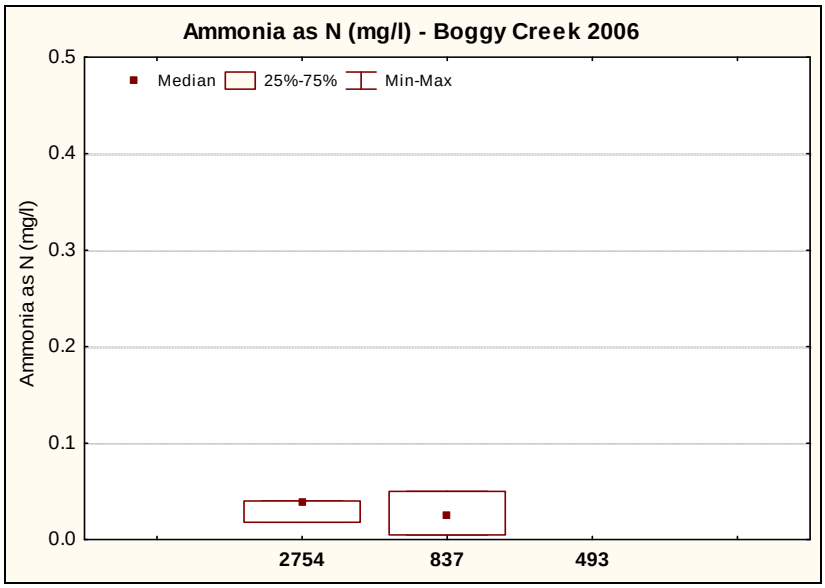


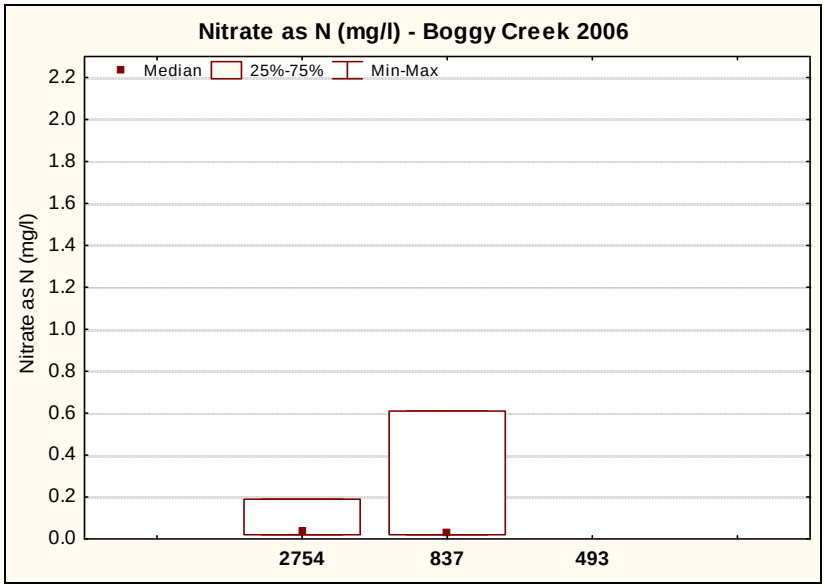


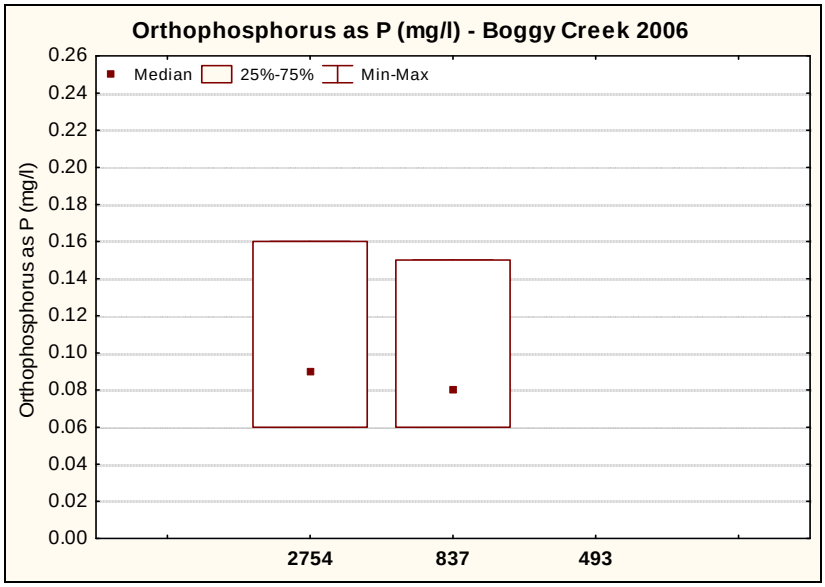


Boggy Creek Watershed

Data Summary Graphs – Nutrients

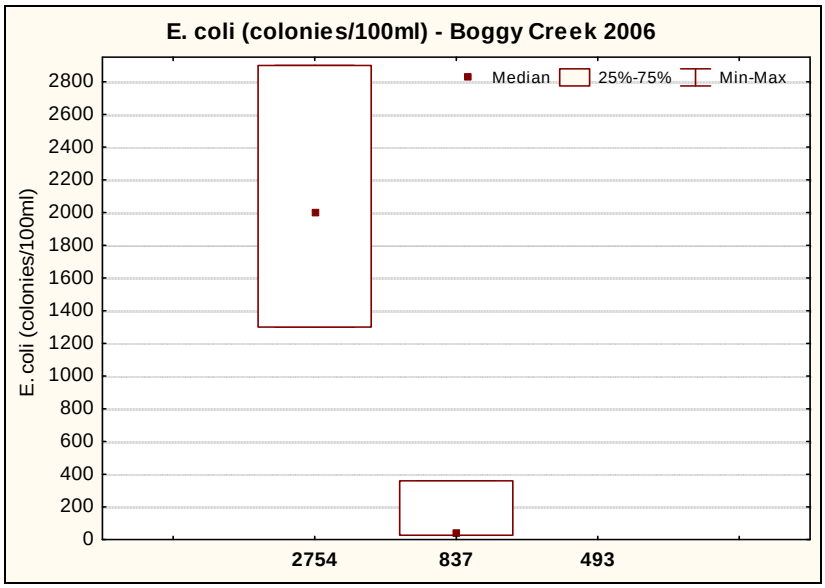


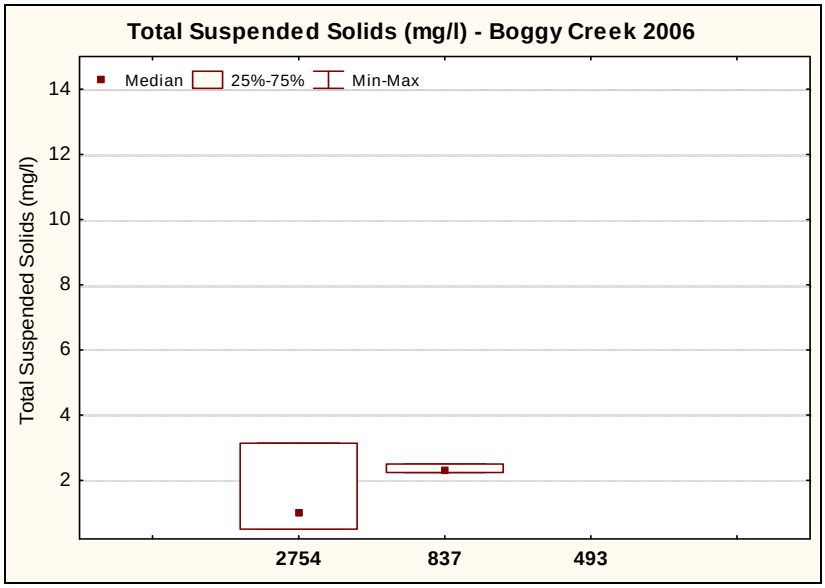


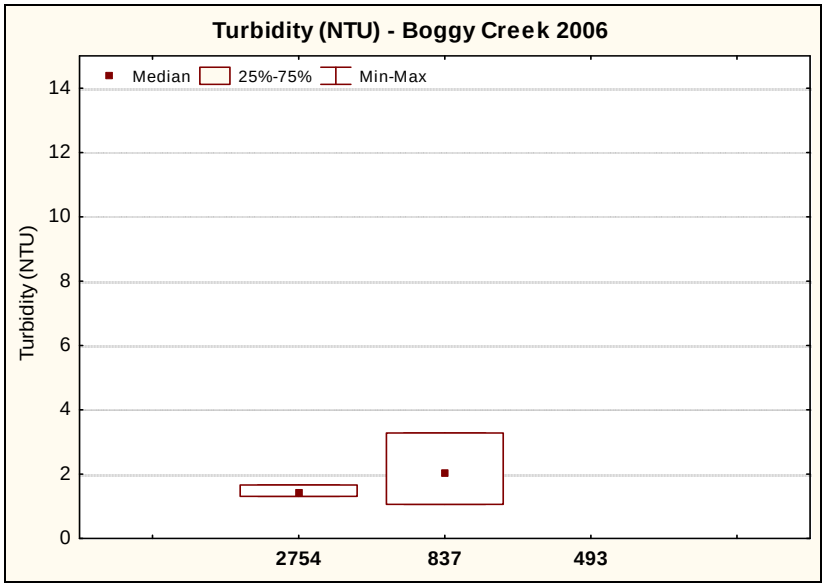


Boggy Creek Watershed

Data Summary Graphs – Physical Parameters



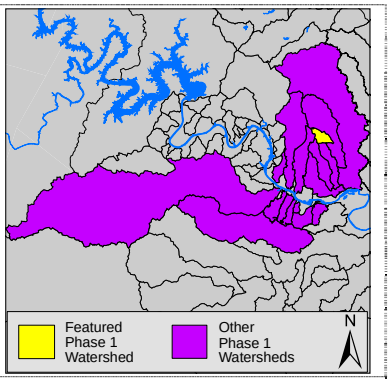




Buttermilk Creek Watershed

Summary Sheet

Catchment	Total area	2 square miles
	Area in recharge	none
	Creek length	2 miles
	Receiving water	Little Walnut
Demographics	2000 population	10,533
	2030 projected population	11,661
	30 year projected % increase	11 %
Land Use	Impervious cover ('97 crwr data)	49.6 %
Overall EII Scores	2000	64
	2003	54
	2006	55



Flow Regime* for Sample Sites on Buttermilk Creek Upstream to Downstream

Site #	Site Name	2003 Feb 19 WQ	2003 Mar 10-17 Bio	2003 May 14 WQ	2003 Sep 23 WQ	2003 Dec 3 WQ	2006 Feb 22 WQ	2006 May 18 WQ	2006 Jul 5-12 Bio	2006 Aug 23 WQ	2006 Nov 29 WQ
3861	Buttermilk at Victory Christian Center						B	B	B	B	B
782	Buttermilk at Providence Ave	B	B	B	B	n	n	B	B	n	n
783	Buttermilk at Cameron Road	B	B	B	B	B					
851	Buttermilk at Little Walnut Creek	B	B	B	B	B	B	B	B	B	B

* B = baseflow conditions n = no flow was present Storm = storm flow was present
Blue = Samples were taken Grey = Samples were not taken Blank = site not visited

	Parameter	Mean	Max	Min	Relative concentrations compared to other 2006 Phase 1 watersheds
Physicochemical	**D.O.** mg/l	6.7	10.1	1.6	Below average at Site 3861 and 782, average[1] at Site 851
	pH st.units	7.7	8.3	7.2	Below average at Site 3861 and 782, above average[1] at Site 851
	Cond uS/cm	681	853	485	Above average at Site 3861, decreasing trend downstream
	SO_4 mg/l	43.2	49.7	36.3	Average[1]
Nutrients	**NH_3** mg/l	0.06	0.30	0.01	One high reading at Site 3861 in November.
	NO_3 mg/l	1.51	4.01	0.06	Consistently high at Site 3861, high at Site 782, average[1]at Site 8561
	Ortho P mg/l	0.04	0.08	0.02	Average[1]
Sediment Load	**TSS** mg/l	7.7	53.3	0.5	A high value at Site 851 in Feb., above average concentrations at Site 3861
	Turbidity ntu	10.2	83.2	0.6	A high value at Site 851 in Feb., average[1] concentrations at other sites
Biology	**E.Coli** /100ml	1,638	4,000	170	Sites 3861 and 851 above average with some very high concentrations
	Benthic Macs	For both benthic macroinvertebrates and diatoms, there was a trend in which scores increased in quality proceeding downstream. Site 3861 showed below average scores for most metric parameters			
	Diatoms				

[1] values for this parameter are similar to the median scores for the other 2006 Phase 1 watersheds

Discussion: The 2006 scores from Sites 851 and 782 remain similar to the scores from previous years. Site 3861 is a new site which scored poorly on most sub-indices. The chronically elevated nutrients and bacteria concentrations at Site 3861 may indicate wastewater line leakage. This site is also characterized by low DO, low pH, high conductivity and high nutrients. During two of the site visits, surface water teams notified the Spills Response team of suspected sewage contamination. Odor, bubbles and prolific algal mattes were observed.

Sub-index scores for Buttermilk Creek Sites (upstream to downstream) 2000, 2003, 2006

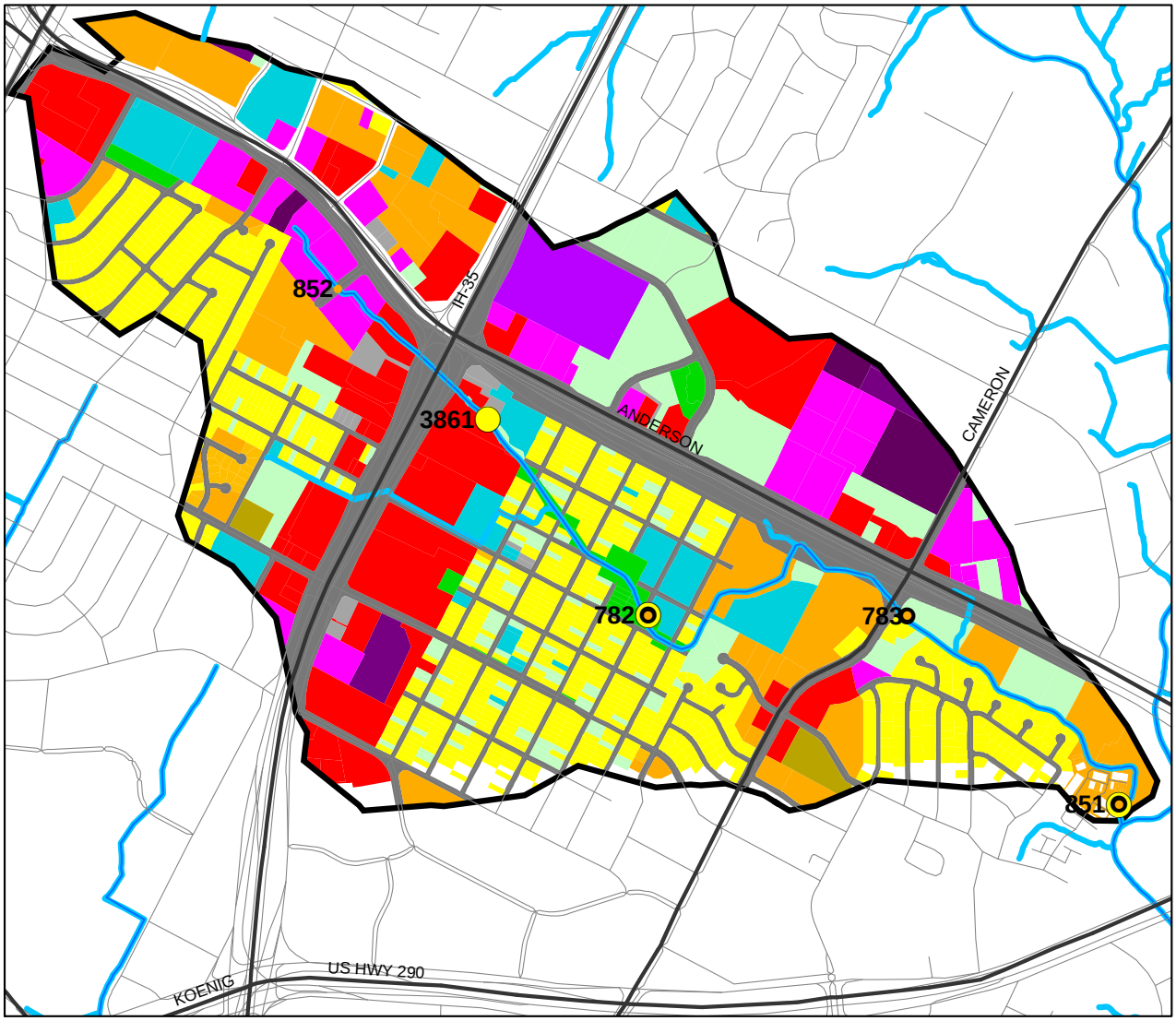
Site Number	Site 3861			Site 782			Site 783			Site 851		
Year of Sampling	2000	2003	2006	2000	2003	2006	2000	2003	2006	2000	2003	2006
Water Quality			37	56	53	51	60	47		67	61	60
Sediment			70	91	70	70	91	70		91	70	70
Contact Recreation			25	76	58	34	79	65		78	33	31
Non-Contact Rec.			71	72	60	78	69	54		78	58	77
Physical Integrity			53	31	40	46	36	51		41	42	53
Aquatic Life			36	20	29	56	51	55		68	48	75
Benthic Mac.			22	35	24	52	53	31		84		69
Diatom			49	4	33	59	48	78		51	48	80
Total EII Score			49	58	52	56	64	57		71	52	61

* sediment samples only collected at the downstream site, blank cells indicate parameter was not collected, blank columns indicate site was dropped

100-87.5 Excellent 87.5-75 V. Good 75-62.5 Good 62.5-50 Fair 50-37.5 Marginal 37.5-25 Poor 25-12.5 Bad 12.5-0 V. Bad

Buttermill Creek Watershed

Land Use Map



0 0.25 0.5 1 Miles

N

Landuse Coverage Based on 2003 Data

Land Use and Development:

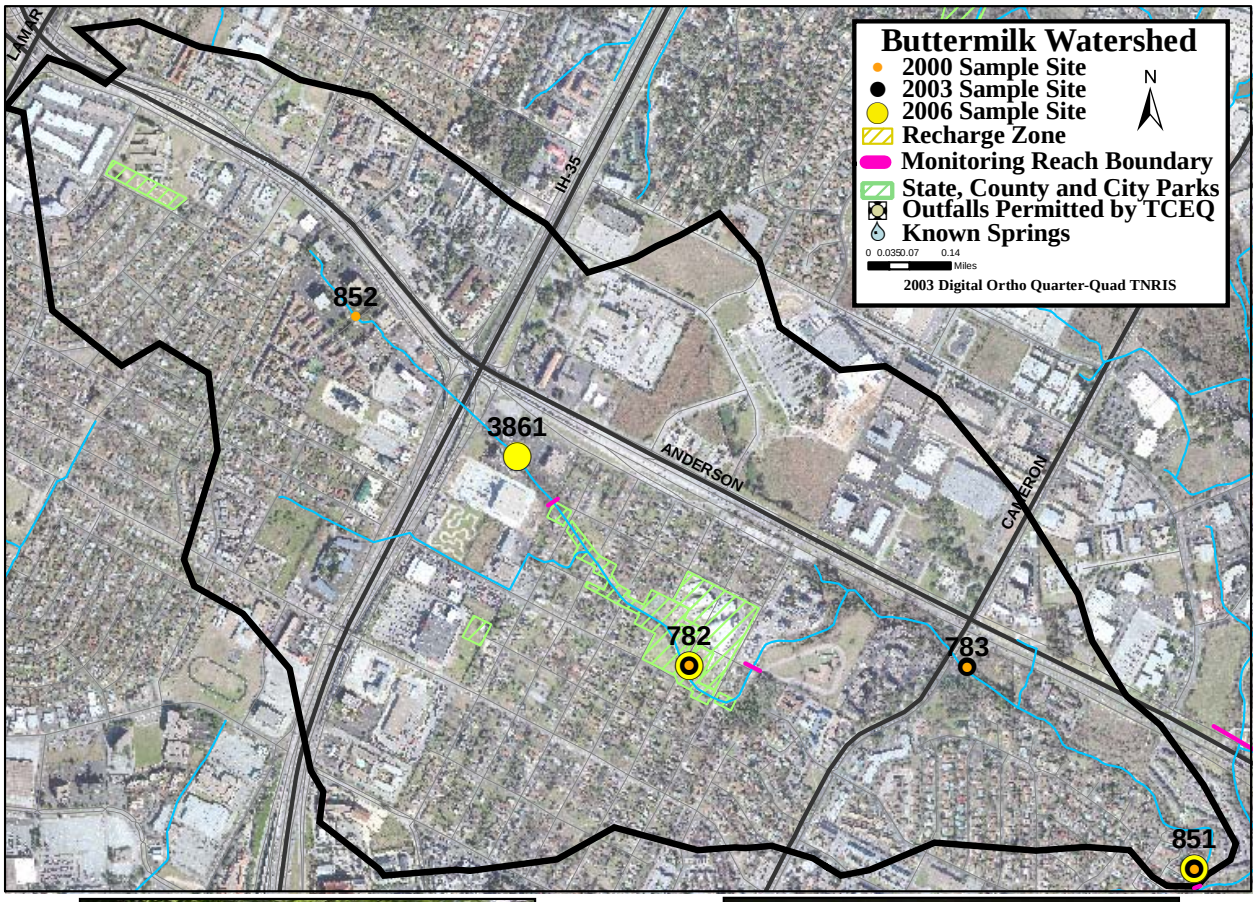
At almost 50% impervious cover, the Buttermilk Creek watershed has the third highest impervious cover of all of Austin's watersheds. Roadways comprise a relatively large percentage (23%) of the area. Well known sites such as St. John's Park and T.A. Brown Park are some of the only green areas in a densely commercially and residentially developed watershed. Baseflow is fairly consistent in the lower half of the watershed due to springs and seeps, however, waste water leaks potentially contribute as well.

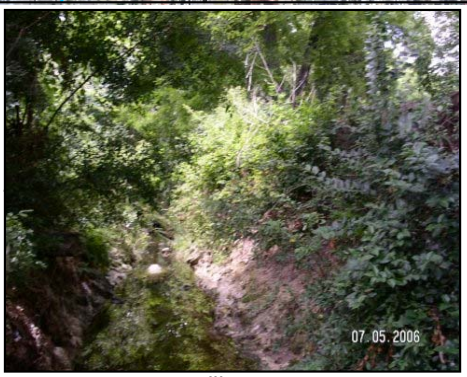
Buttermilk Creek Watershed

- 2000 Sample Site
- 2003 Sample Site
- 2006 Sample Site
- Recharge Zone
- Major Roads
- Creeks
- Single-Family
- Large Lot Single-Family
- Multi-family
- Commercial
- Office
- Industrial
- Mining / Landfill
- Civic
- Golf Course / Agricultural
- Open / Parks / Undeveloped
- Wildlife Preserve
- Transportation / Utilities

Buttermilk Creek Watershed

Aerial Map





3861 Buttermilk at V.C.C. 7-5-06

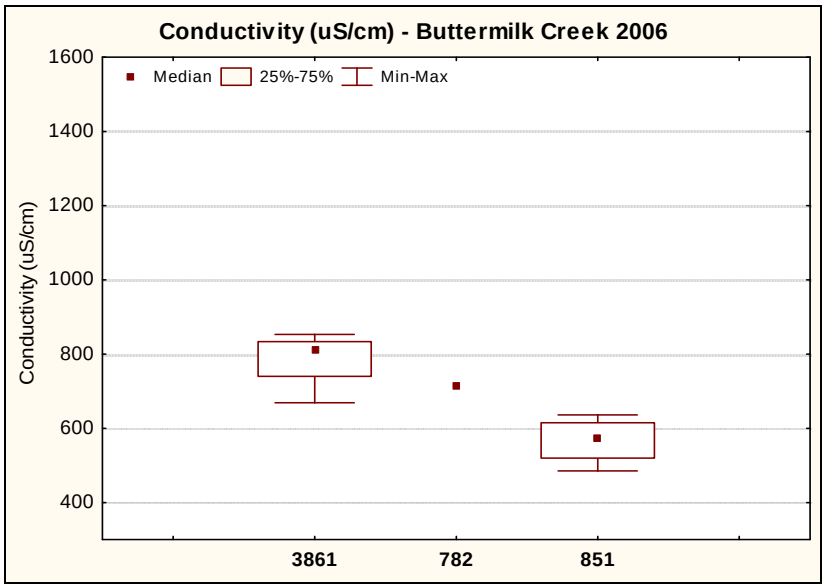
782 Buttermilk at Providence 07/05/2006

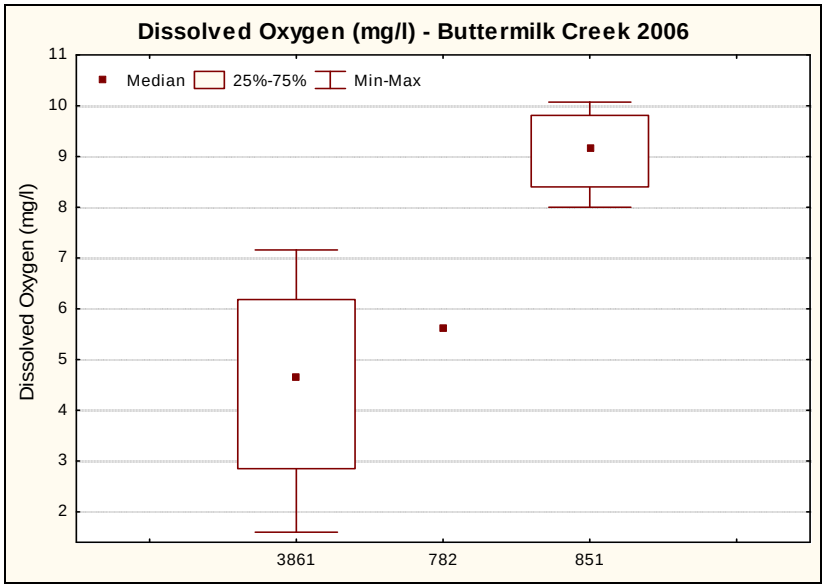
783 Buttermilk at Cameron Rd

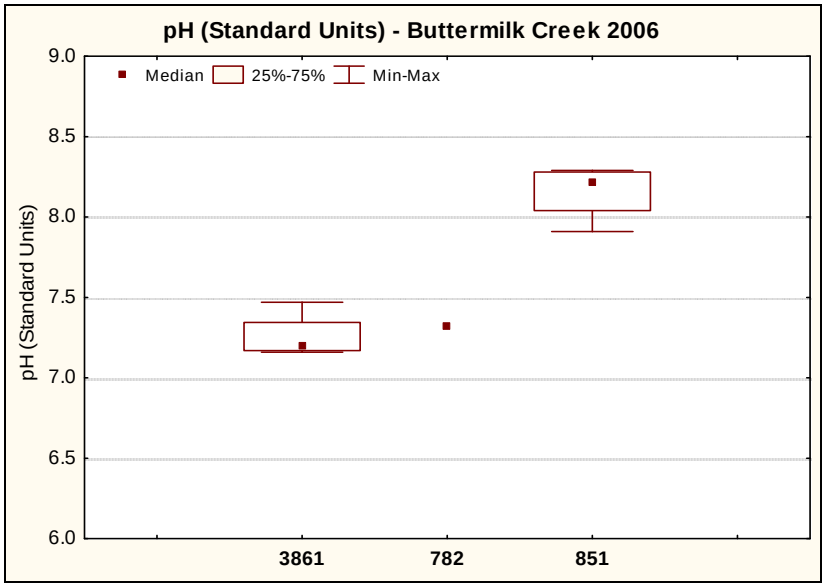
851 Buttermilk at Little Walnut 07/10/2006

Buttermilk Creek Watershed

Data Summary Graphs – Field Parameters

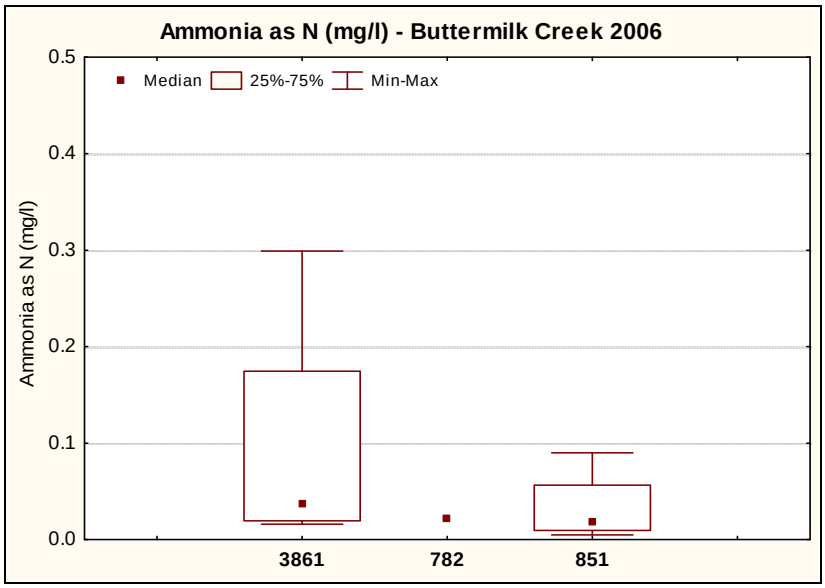


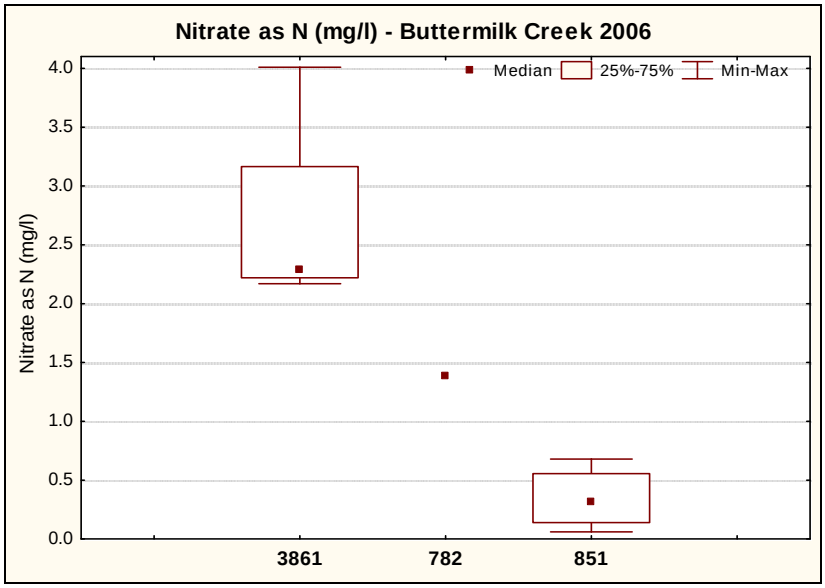


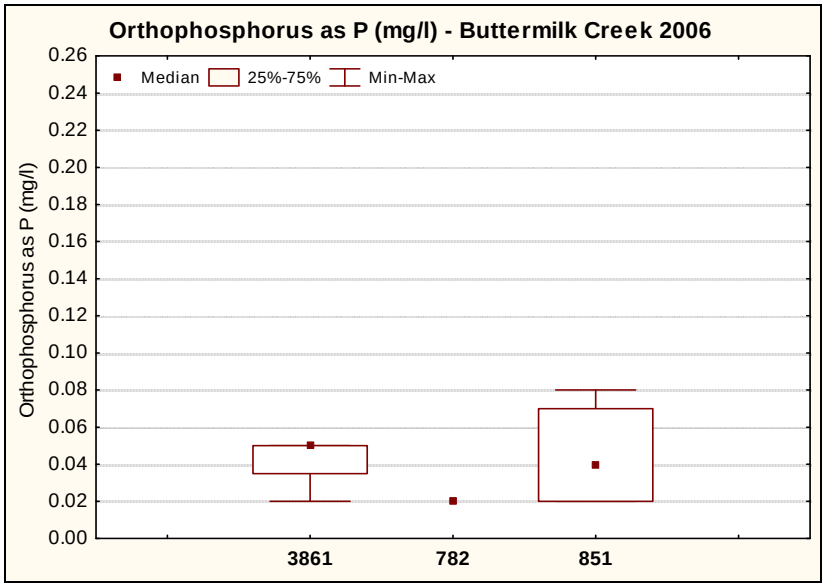


Buttermilk Creek Watershed

Data Summary Graphs – Nutrients

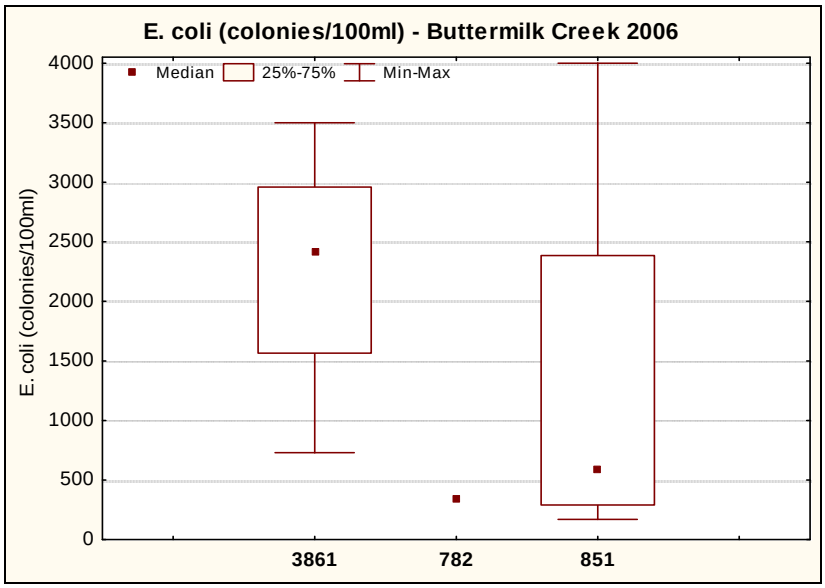


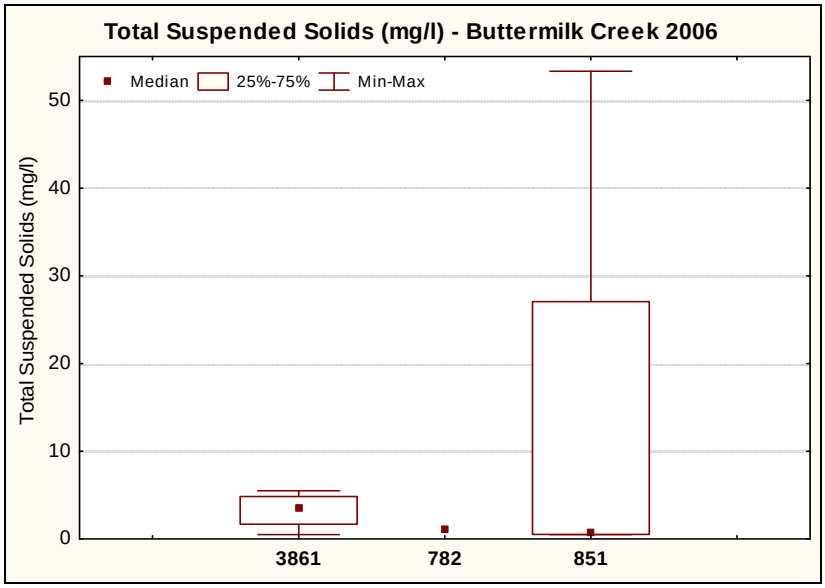


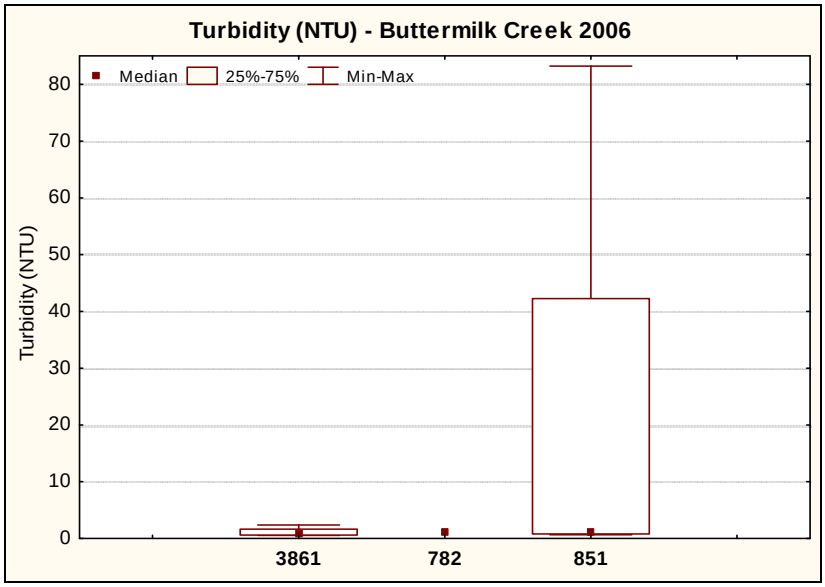


Buttermilk Creek Watershed

Data Summary Graphs – Physical Parameters



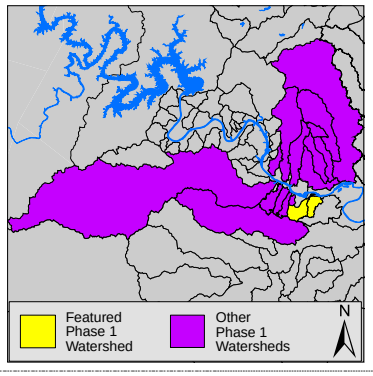




Country Club Creek Watershed

Summary Sheet

Catchment	Total area	5 square miles			
	Area in recharge	none			
	Creek length	7 miles			
	Receiving water	Colorado River			
Demographics	2000 population	14,620			
	2030 projected population	15,903			
	30 year projected % increase	9 %			
Land Use	Impervious cover ('97 crwr data)	25.9 %			
Overall EII Scores	W. Country Club 2000	60	E. Country Club 2000	55	
	W. Country Club 2003	54	E. Country Club 2003	47	
	W. Country Club 2006	51	E. Country Club 2006	42	



Flow Regime* for Sample Sites on Country Club Creek Upstream to Downstream

		2003					2006				
		Feb	Mar	May	Sep	Dec	Feb	May	Jul	Aug	Nov
		19	10-17	14	23	3	22	18	5-12	23	29
Site #	Site Name	WQ	Bio	WQ	WQ	WQ	WQ	WQ	Bio	WQ	WQ
1475	East Country Club at ACC						B	n	n	n	B
848	East Country Club below Grove Drive	B	B	B	B	B					
850	West Country Club at East Oltorf	B	B	B	B	B	B	B	B	n	B
1474	West Country Club at Krieg Fields	B	B	B	B	n	n	n	n	n	n

* B = baseflow conditions n = no flow was present Storm = storm flow was present
Blue = Samples were taken Grey = Samples were not taken Blank = site not visited

	Parameter	Mean	Max	Min	Relative concentrations compared to other 2006 Phase 1 watersheds
Physicochemical	**D.O.** mg/l	6.3	9.2	3.4	Below average at Site 1475, average[1] at Site 850
	pH st.units	7.72	7.85	7.59	Average[1]
	Cond uS/cm	934	1,233	634	A very high value at Site 1475 in Feb, average[1] for all other samples
	SO_4 mg/l	98.2	136.0	60.4	Consistently high at both sites
Nutrients	**NH_3** mg/l	0.02	0.03	0.01	Average[1]
	NO_3 mg/l	0.15	0.25	0.05	Average[1]
	Ortho P mg/l	0.10	0.10	0.10	Above average at Site 1475, average[1] at Site 850
Sediment Load	**TSS** mg/l	7.0	13.5	0.6	Consistently above average or high concentrations at both sites
	Turbidity ntu	4.5	6.3	2.7	Consistently above average or high concentrations at both sites
Biology	**E.Coli** /100ml	191	200	182	Average[1]
	Benthic Macs	Average[1] overall, despite some low scoring metric parameters			
	Diatoms	Sites 1475 and 1474 were dry. Site 850 scored poorly on most parameters.			

[1] values for this parameter are similar to the median scores for the other 2006 Phase 1 watersheds

Discussion: Low Scores at Site 1474 are primarily the result of lack of baseflow during all sampling events. Total suspended solids and turbidity is above average compared to the other 2006 watersheds. Although Orthophosphorus concentrations were above average at site 1475, other nutrients at this site and other Country Club sites were average compared to the rest of the 2006 watersheds.

Sub-index scores for Country Club Creek Sites (upstream to downstream) 2000, 2003, 2006

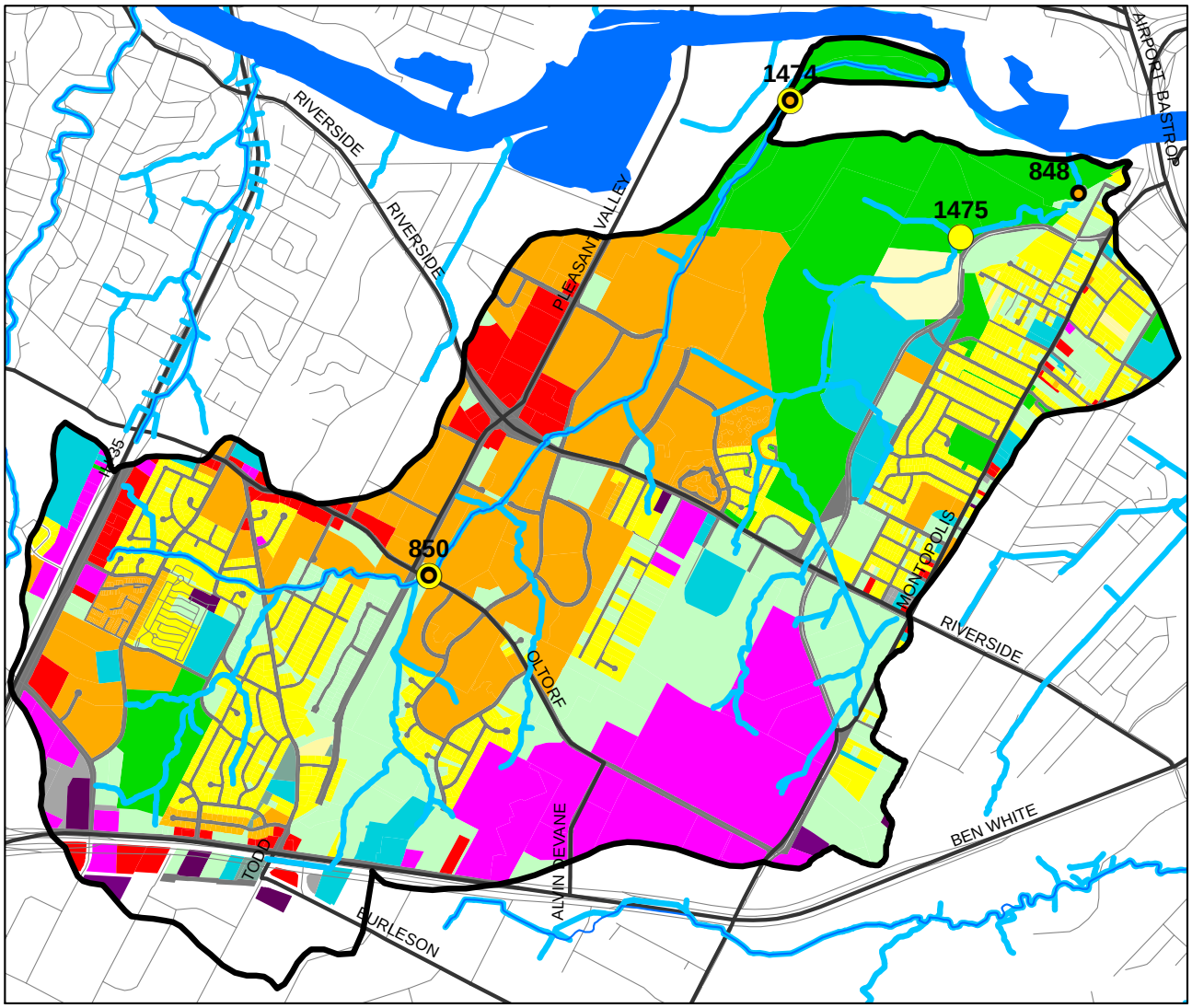
Site Number	Site 1475			Site 848			Site 850			Site 1474		
Year of Sampling	2000	2003	2006	2000	2003	2006	2000	2003	2006	2000	2003	2006
Water Quality			54		31		54	48	58	52	50	
Sediment			85	87	70		87	70	66	87	70	66
Contact Recreation			43		59		73	51	39	72	57	
Non-Contact Rec.			45	53	58		71	54	78	78	81	53
Physical Integrity			24	31	33		28	55	59	52	57	52
Aquatic Life				48	29		22	42	46	43	49	
Benthic Mac.				53	20		29	36	41	44	35	
Diatom				43	37		14	48	51	42	63	
Total EII Score			42	55	47		56	53	58	64	61	43

* sediment samples only collected at the downstream site, blank cells indicate parameter was not collected, blank columns indicate site was dropped

100-87.5 Excellent 87.5-75 V. Good 75-62.5 Good 62.5-50 Fair 50-37.5 Marginal 37.5-25 Poor 25-12.5 Bad 12.5-0 V. Bad

Country Club Creek Watershed

Summary Sheet



0 0.25 0.5 1 Miles

N

Landuse Coverage Based on 2003 Data

Land Use and Development:

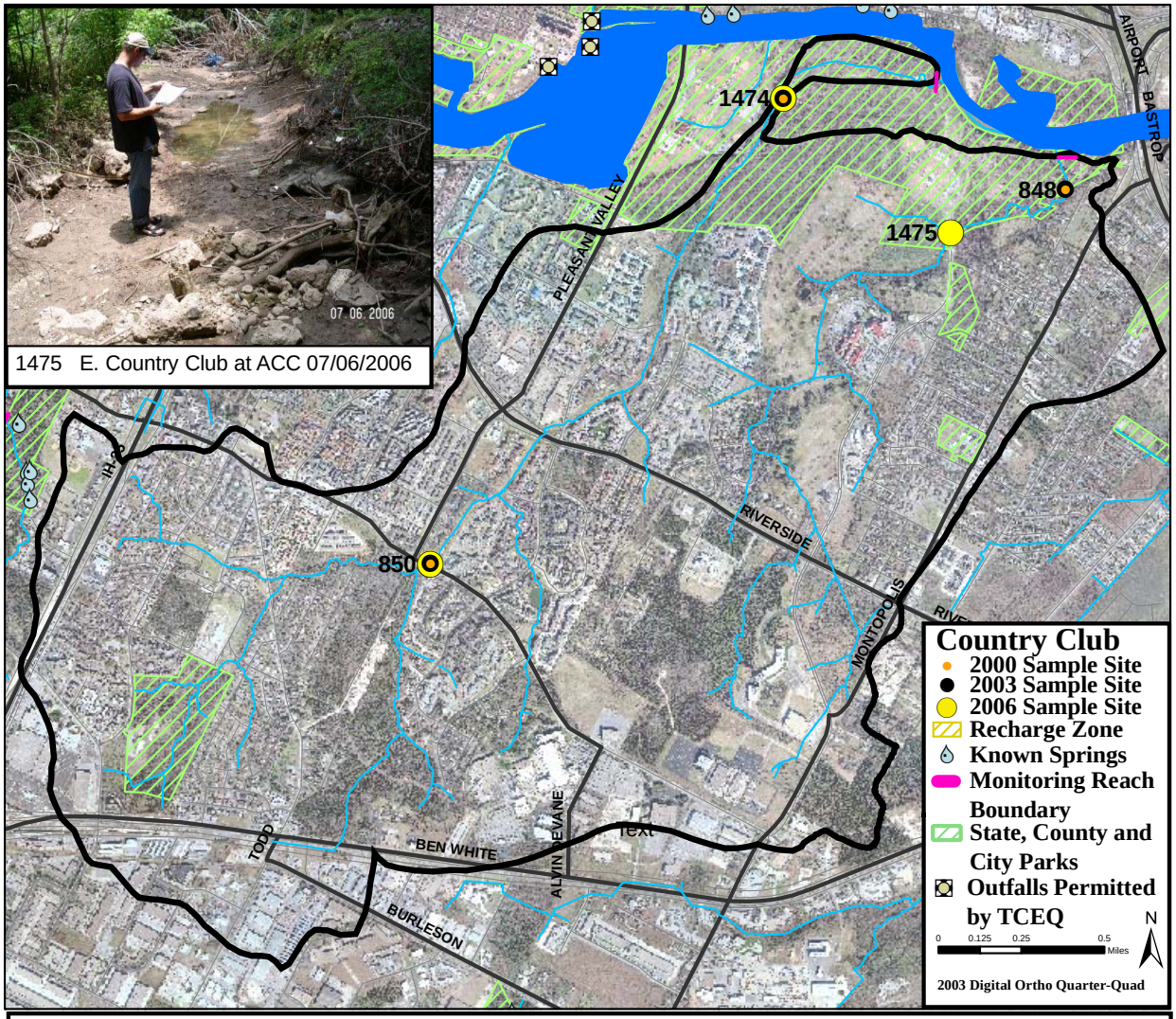
The Country Club Creek watershed is divided into East and West sections which empty into Town Lake separately. The West section is larger and has more impervious cover than the East. West Country Club is still in the early stages of stream development as the watershed has been greatly impacted from channel alteration for flood control. Well known sites in the watershed include ACC Riverside Campus, Mabel Davis Park, and the Pleasant Valley Sportsplex and the new Colorado River Park, which will eventually be larger than Zilker Park. Excessive sediment in the creek can be attributed, in part, to the highly erosive nature of the alluvial soils. The gravel pits in the lower watershed were mined in the early 1900's are now fallow, open areas.

Country Club Watershed

- 2000 Sample Site
- 2003 Sample Site
- 2006 Sample Site
- Recharge Zone
- Major Roads
- Creeks
- Single-Family
- Large Lot Single-Family
- Multi-family
- Commercial
- Office
- Industrial
- Mining / Landfill
- Civic
- Golf Course / Agricultural
- Open / Parks / Undeveloped
- Wildlife Preserve
- Transportation / Utilities

Country Club Creek Watershed

Summary Sheet

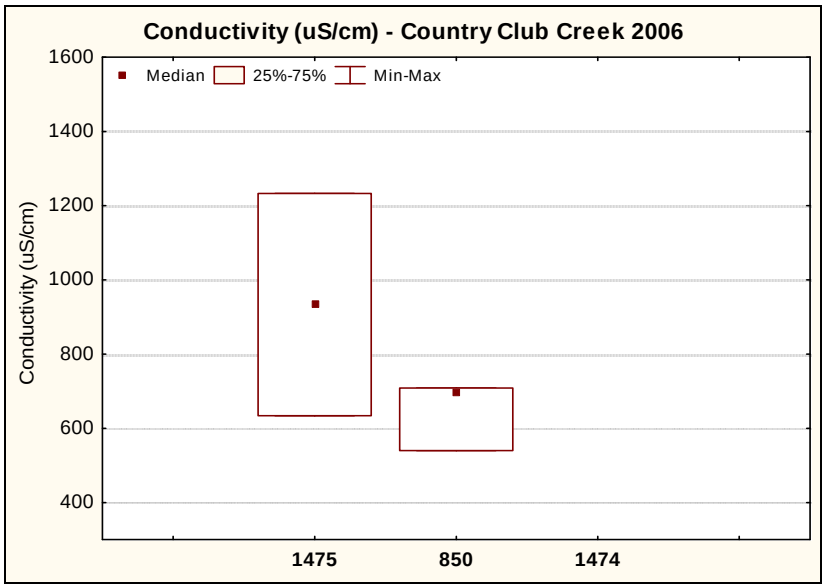


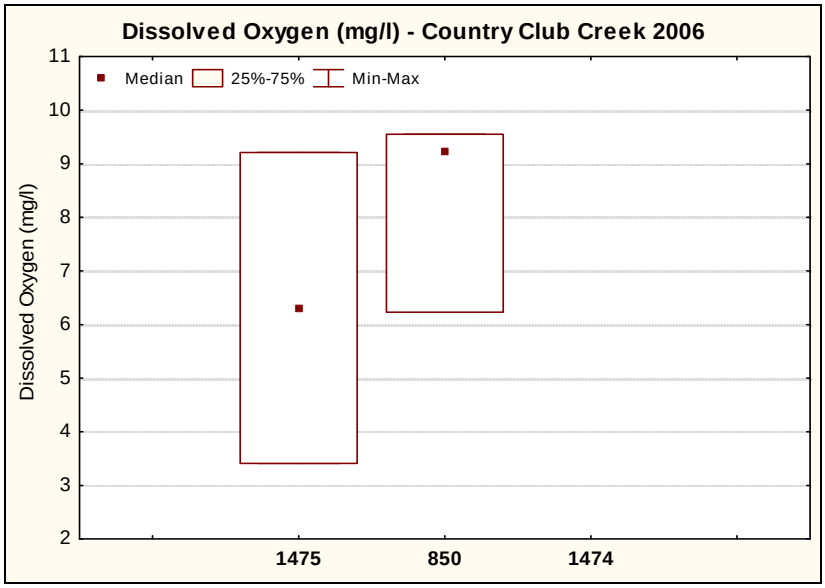
1474 W. Country Club at Krieg Fields

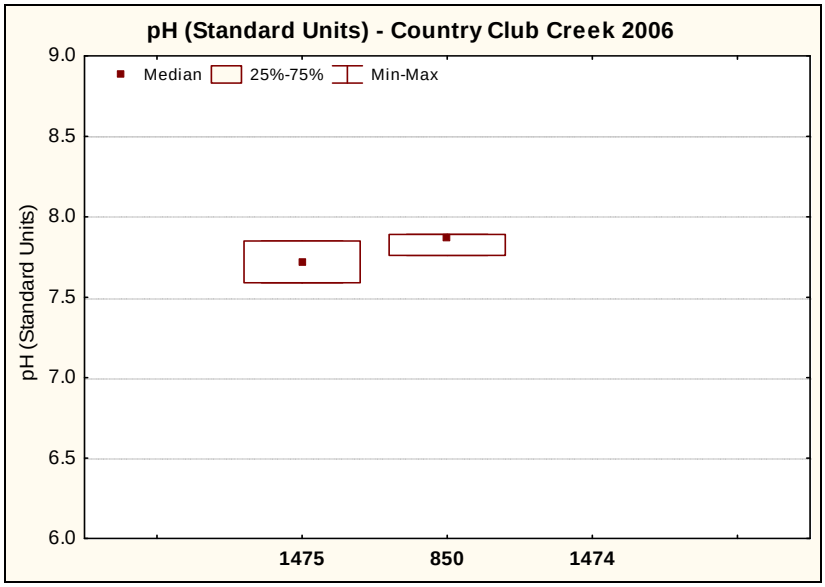
850 W. Country Club at East Oltorf 07/06/2006

Country Club Creek Watershed

Data Summary Graphs – Field Parameters

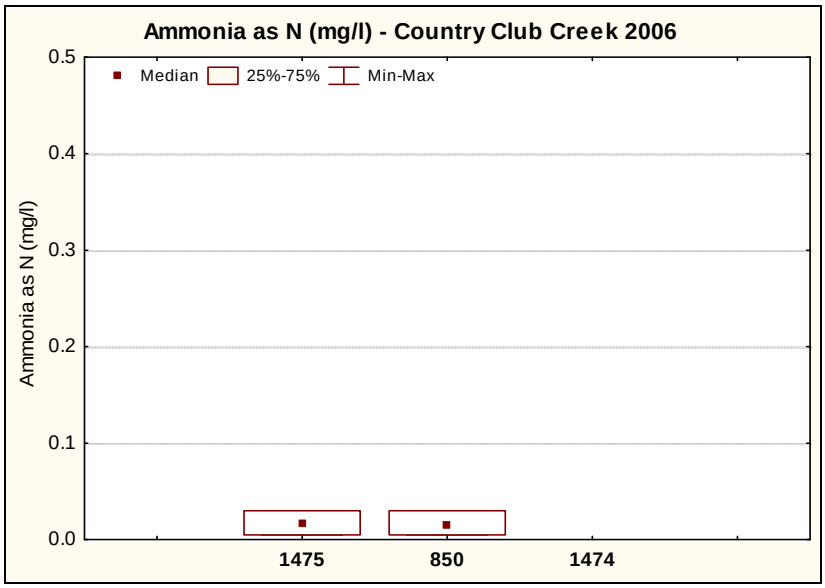


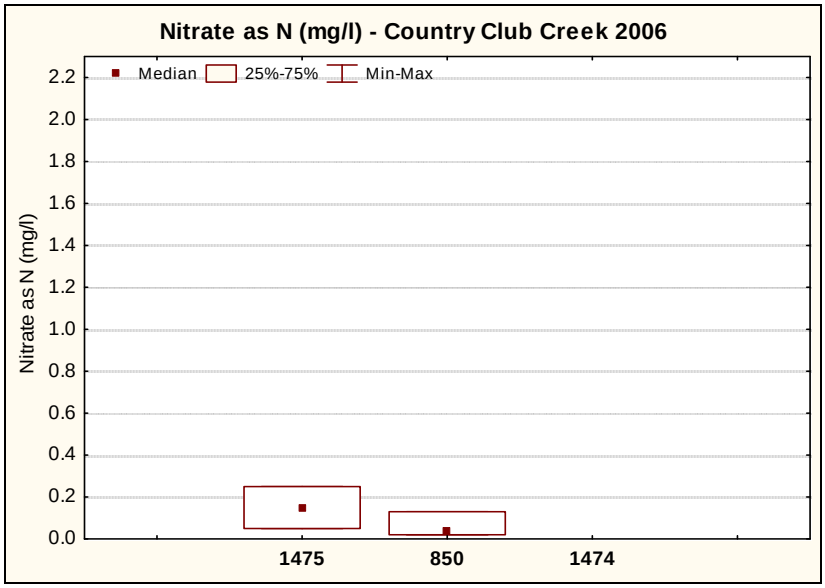


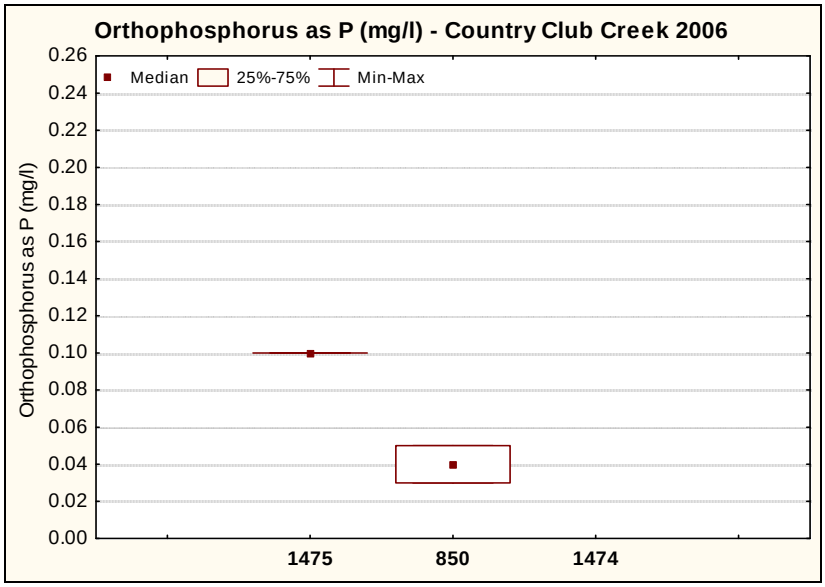


Country Club Creek Watershed

Data Summary Graphs – Nutrients

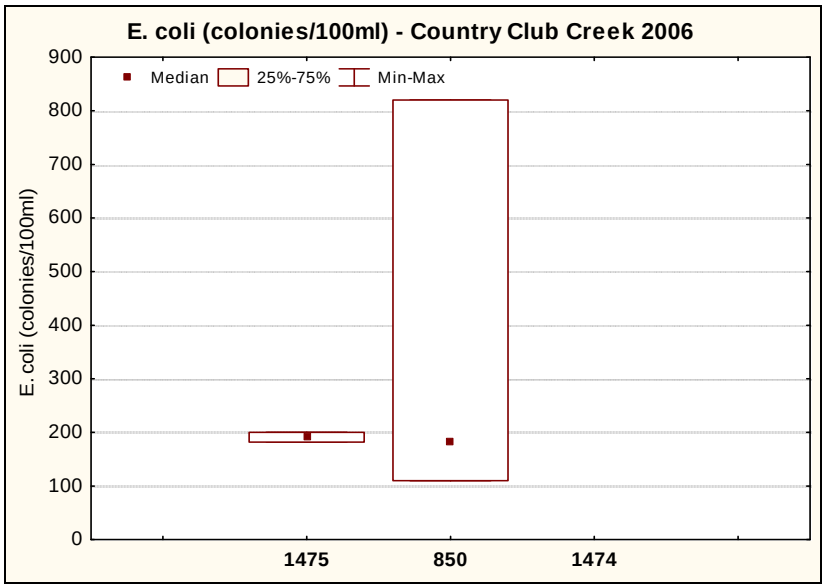


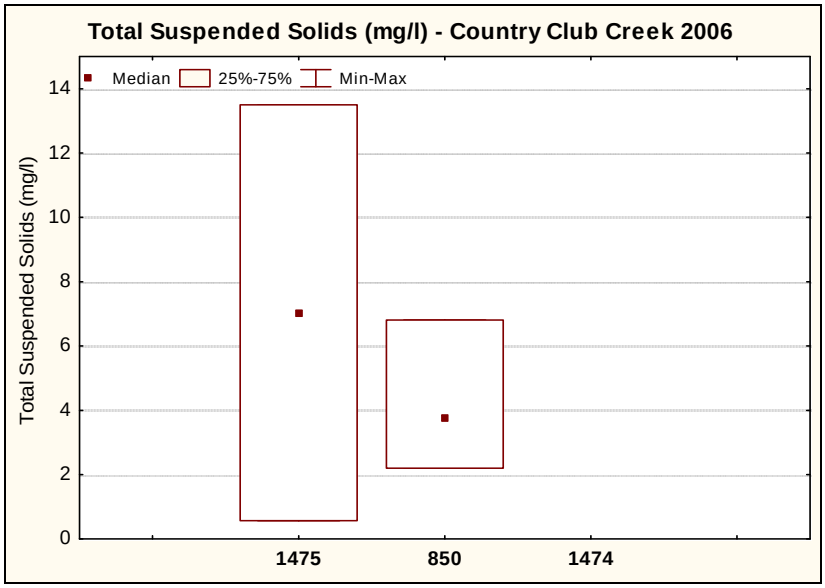


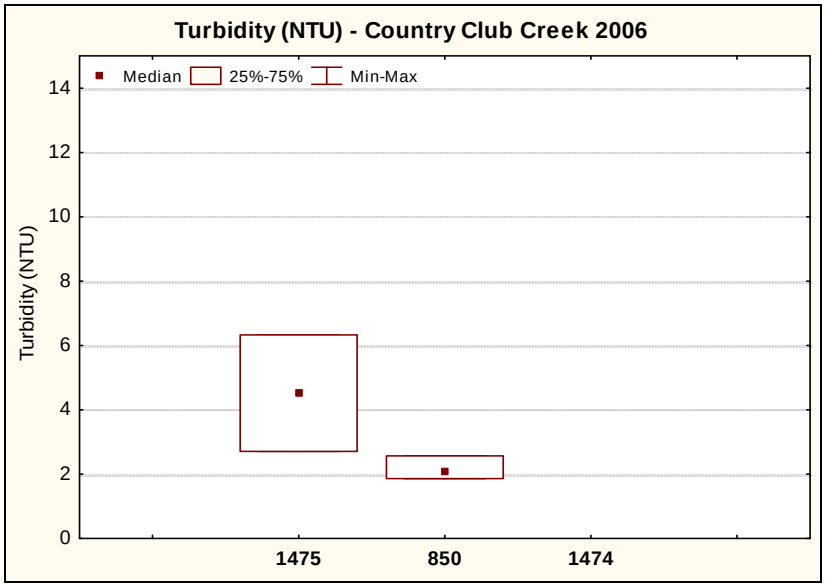


Country Club Creek Watershed

Data Summary Graphs – Physical Parameters



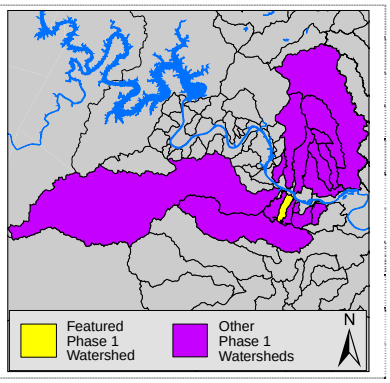




East Bouldin Creek Watershed

Summary Sheet

Catchment	Total area	2 square miles	
	Area in recharge	none	
	Creek length	4 miles	
	Receiving water	Town Lake	
Demographics	2000 population	10,455	
	2030 projected population	12,490	
	30 year projected % increase	19 %	
Land Use	Impervious cover ('97 crwr data)	46.4 %	
Overall EII Scores	2000	50	
	2003	55	
	2006	53	



Flow Regime* for Sample Sites on East Bouldin Creek Upstream to Downstream

		2003					2006				
		Feb 19	Mar 10-17	May 14	Sep 23	Dec 3	Feb 22	May 18	Jul 5-12	Aug 23	Nov 29
Site #	Site Name	WQ	Bio	WQ	WQ	WQ	WQ	WQ	Bio	WQ	WQ
121	East Bouldin d/s of W. Alpine	B	B	B	n	n	B	B	B	n	n
120	East Bouldin at South Austin Center	B	B	B	B	n					
119	East Bouldin at Elizabeth St	B	B	B	B	B	B	B	B	n	B
1338	East Bouldin at Post Oak						B	B	B	n	n
115	East Bouldin at Riverside Drive	B	B	B	B	n					

* B = baseflow conditions n = no flow was present Storm = storm flow was present
Blue = Samples were taken Grey = Samples were not taken Blank = site not visited

	Parameter	Mean	Max	Min	Relative concentrations compared to other 2006 Phase 1 watersheds
Physicochemical	**D.O.** mg/l	5.3	7.4	2.6	Low at Site 121, average[1] at Sites 121 and 119
	pH st.units	7.45	7.90	6.96	Below average in November and May
	Cond uS/cm	672	792	452	Average[1] with the exception of one low value at Site 121 in February
	SO_4 mg/l	43.2	67.2	17.7	Average[1] at Site 121 and 119, above average at Site 119
Nutrients	**NH_3** mg/l	0.07	0.28	0.02	Site 121 consistently high concentrations. Other sites average[1]
	NO_3 mg/l	0.16	0.58	0.02	Average[1]
	Ortho P mg/l	0.10	0.25	0.05	Above average at Sites 121 and 119, average[1] at Site 1338
Sediment Load	**TSS** mg/l	2.6	5.3	0.6	Site 121 consistently above average concentrations. Other sites average[1]
	Turbidity ntu	2.4	5.2	0.8	Site 121 consistently high concentrations. Other sites average[1]
Biology	**E.Coli** /100ml	1,150	4,800	14	One high concentration at Site 119 in May. Other sites average[1]
	Benthic Macs	Below average at most sites. Site 121 was 70% midges. Site 1338 only had 74 individuals total			
	Diatoms	Typically below average scores. Although Site 1338 was the most diverse of all sites, Site 121 was the least			

[1] values for this parameter are similar to the median scores for the other 2006 Phase 1 watersheds

Discussion: East Bouldin sites consistently score poorly in biological integrity despite reliable baseflow at most sites. Nutrients are high at Site 121, but there appears to be a downstream decreasing trend in concentration. Total suspended solids and turbidity are high at Site 121. In addition, Site 121 had one of the poorest benthic macroinvertebrate and diatom communities of 2006.

Sub-index scores for East Bouldin Creek Sites (upstream to downstream) 2000, 2003, 2006

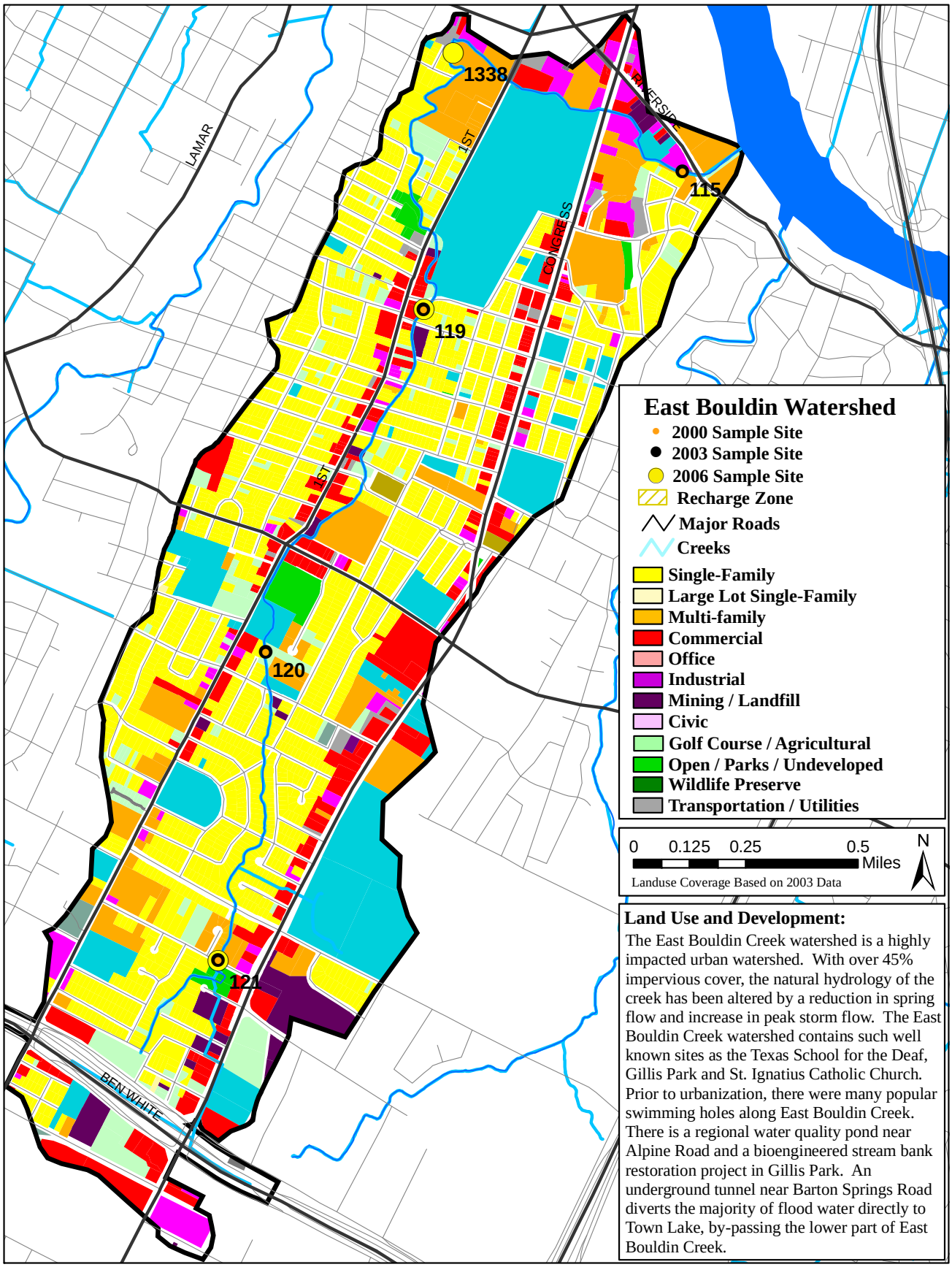
Site Number	Site 121			Site 120			Site 119			Site 1338			Site 115		
Year of Sampling	2000	2003	2006	2000	2003	2006	2000	2003	2006	2000	2003	2006	2000	2003	2006
Water Quality	61	56	51	55	54		51	43	55			59	39	35	
Sediment	62	68	42	62	68		62	68	42			42	62	68	
Contact Recreation	76	83	43	59	49		57	52	52			34	53	40	
Non-Contact Rec.	49	83	58	67	71		56	88	77			83	49	46	
Physical Integrity	22	46	47	31	46		88	69	60			57	30	57	
Aquatic Life	29	34	26	26	26		29	22	58			57	29	35	
Benthic Mac.	33	26	27	27	26		27	16	57			47	35	52	
Diatom	25	42	25	25	25		30	28	58			66	23	18	
Total EII Score	50	62	45	50	52		57	57	57			55	44	47	

* sediment samples only collected at the downstream site, blank cells indicate parameter was not collected, blank columns indicate site was dropped

100-87.5 Excellent 87.5-75 V. Good 75-62.5 Good 62.5-50 Fair 50-37.5 Marginal 37.5-25 Poor 25-12.5 Bad 12.5-0 V. Bad

East Bouldin Creek Watershed

Land Use Map



Land Use and Development:

The East Bouldin Creek watershed is a highly impacted urban watershed. With over 45% impervious cover, the natural hydrology of the creek has been altered by a reduction in spring flow and increase in peak storm flow. The East Bouldin Creek watershed contains such well known sites as the Texas School for the Deaf, Gillis Park and St. Ignatius Catholic Church. Prior to urbanization, there were many popular swimming holes along East Bouldin Creek. There is a regional water quality pond near Alpine Road and a bioengineered stream bank restoration project in Gillis Park. An underground tunnel near Barton Springs Road diverts the majority of flood water directly to Town Lake, by-passing the lower part of East Bouldin Creek.

East Bouldin Creek Watershed

Aerial Map

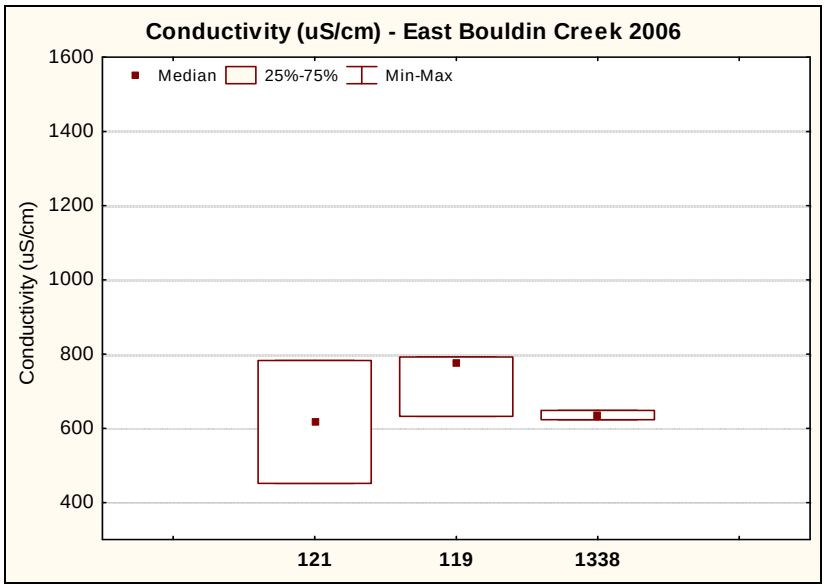
1338 East Bouldin at Post Oak 07/06/2006

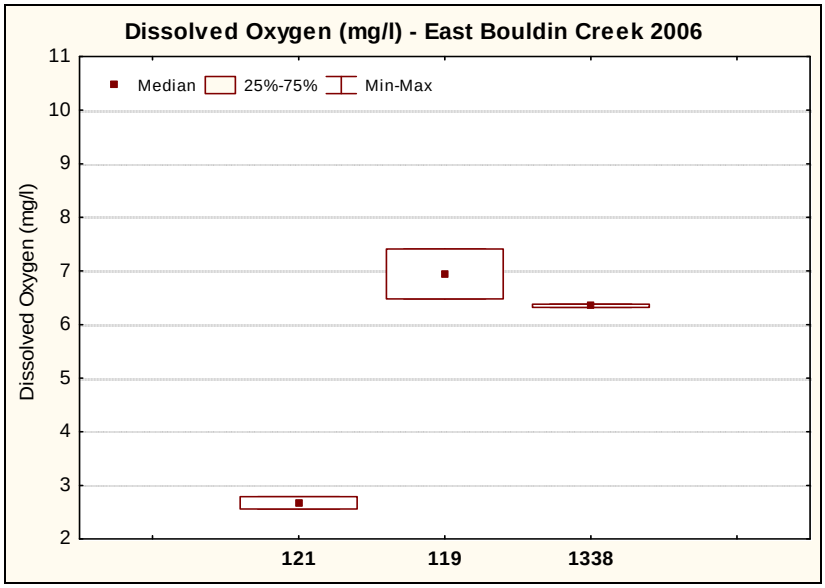
119 East Bouldin at Elizabeth St 07/05/2006

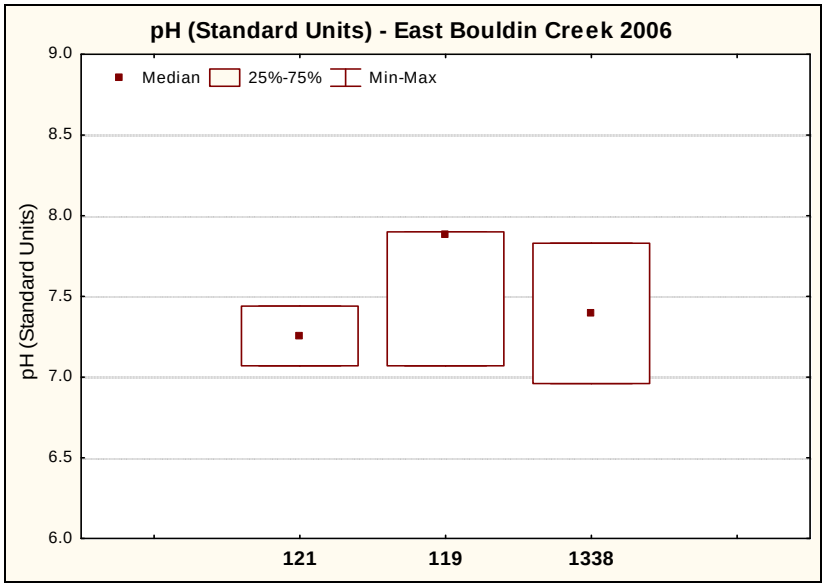
121 East Bouldin d/s of W. Alpine 07/05/2006

East Bouldin Creek Watershed

Data Summary Graphs – Field Parameters

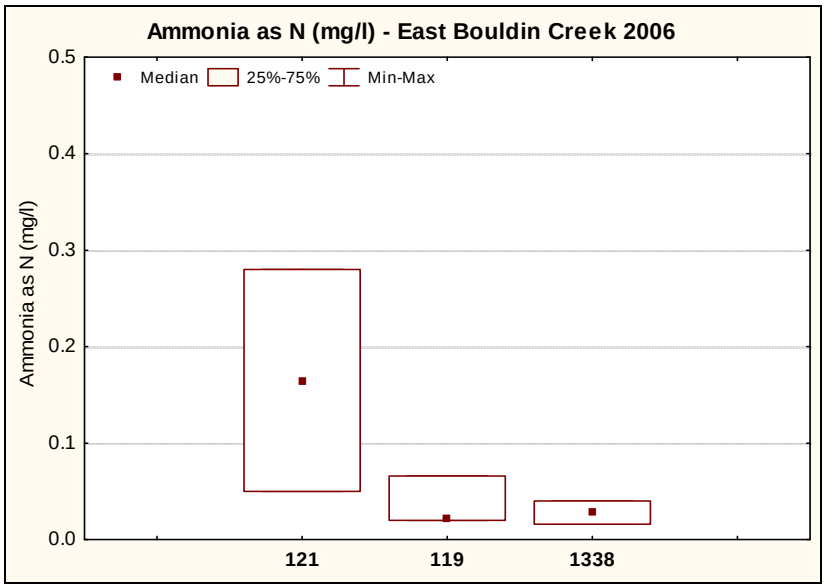


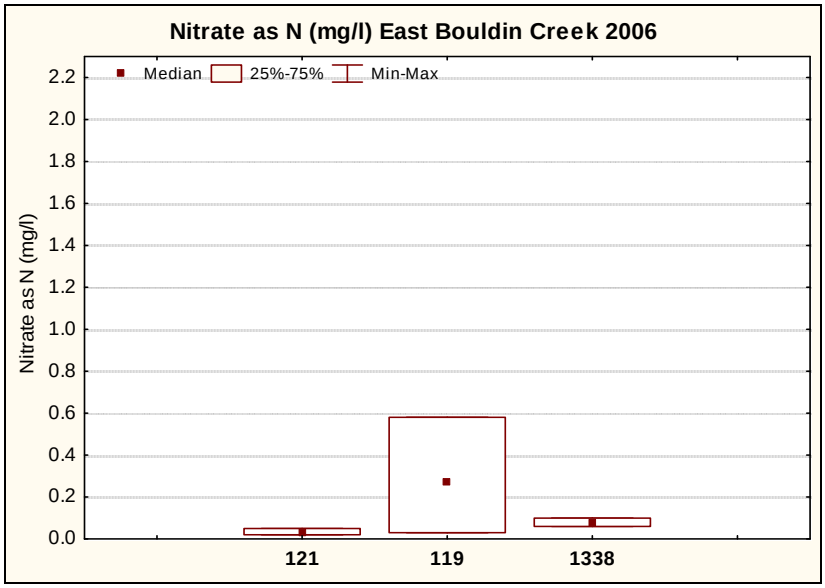


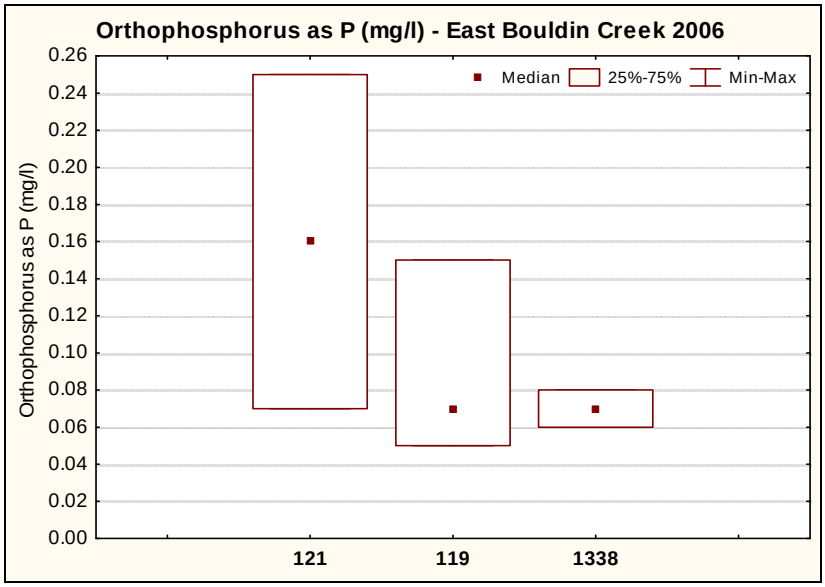


East Bouldin Creek Watershed

Data Summary Graphs – Nutrients

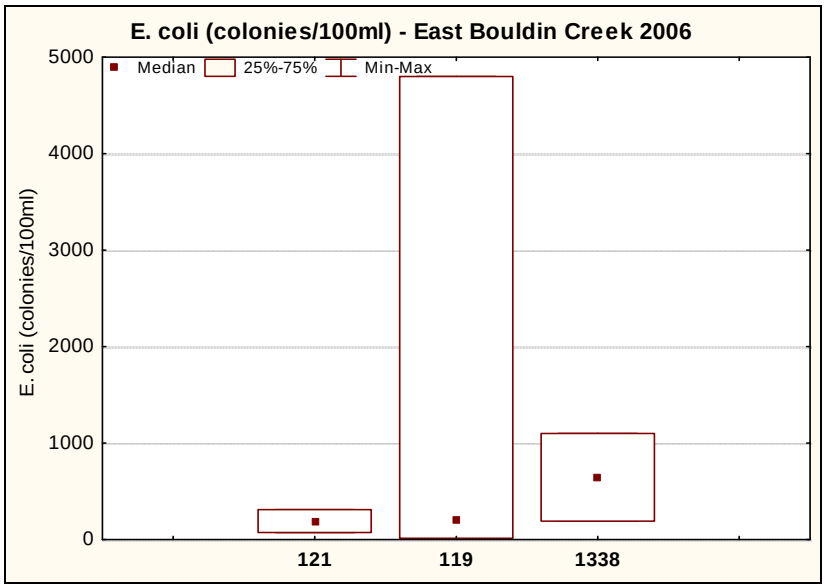


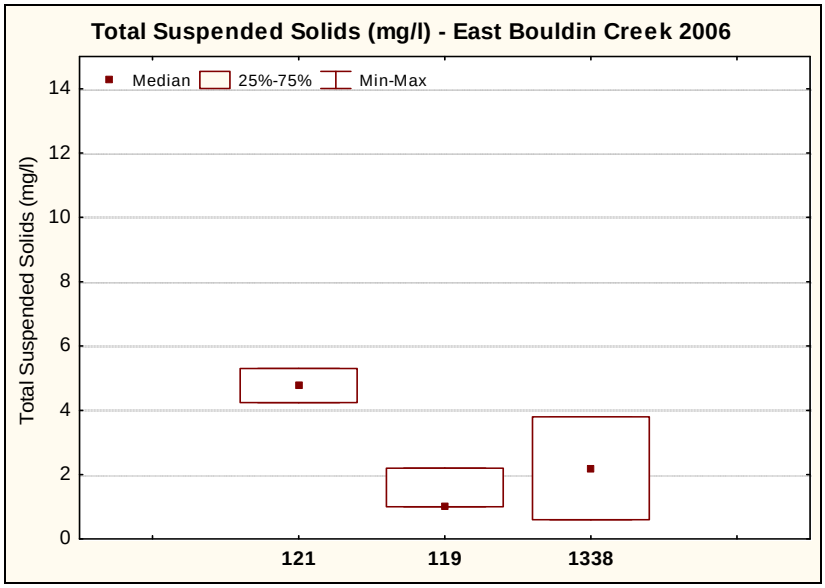


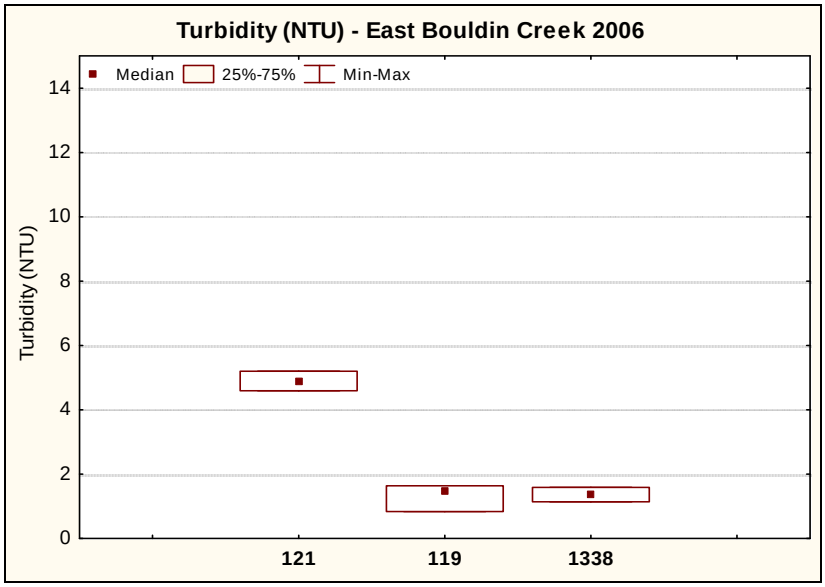


East Bouldin Creek Watershed

Data Summary Graphs – Physical Parameters



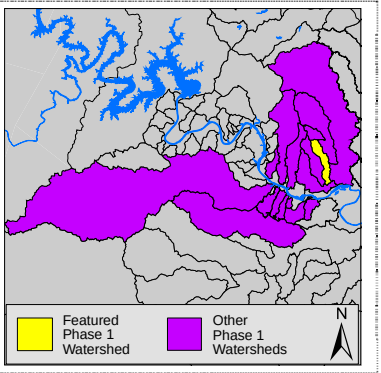




Fort Branch Watershed

Summary Sheet

Catchment	Total area	3 square miles	
	Area in recharge	none	
	Creek length	6 miles	
	Receiving water	Boggy Creek	
Demographics	2000 population	16,796	
	2030 projected population	19,659	
	30 year projected % increase	17 %	
Land Use	Impervious cover ('97 crwr data)	38.2 %	
Overall EII Scores	2000	60	
	2003	55	
	2006	52	



Flow Regime* for Sample Sites on Fort Branch Upstream to Downstream

		2003					2006				
		Feb 19	Mar 10-17	May 14	Sep 23	Dec 3	Feb 22	May 18	Jul 5-12	Aug 23	Nov 29
Site #	Site Name	WQ	Bio	WQ	WQ	WQ	WQ	WQ	Bio	WQ	WQ
126	Fort Branch at Glencrest	B	B	B	B	B	B	B	B	B	B
125	Fort Branch above Manor Rd	B	B	B	B	B	B	B	B	n	B
898	Fort Branch at Carson Hill (Single Shot)	B	B	B	B	n	n	n	n	n	n
123	Fort Branch at North Boggy	B	B	B	B	n	n	n	n	n	n

* B = baseflow conditions n = no flow was present Storm = storm flow was present
Blue = Samples were taken Grey = Samples were not taken Blank = site not visited

	Parameter	Mean	Max	Min	Relative concentrations compared to other 2006 Phase 1 watersheds
Physicochemical	**D.O.** mg/l	7.4	12.4	3.5	Average[1] at Site 125, wide range from high to low at Site 126
	pH st.units	7.96	8.21	7.70	Average[1] at Site 126, above average at Site 125
	Cond uS/cm	594	877	454	Average[1] with the exception of one high value at Site 126 in August
	SO_4 mg/l	44.7	78.1	32.1	Average[1] with the exception of one high concentration at Site 126 in August
Nutrients	**NH_3** mg/l	0.02	0.05	0.01	Average[1]
	NO_3 mg/l	0.27	0.77	0.02	Average[1]
	Ortho P mg/l	0.22	0.49	0.03	Consistently high concentrations at Site 126, avg[1] at Site 125
Sediment Load	**TSS** mg/l	2.6	5.6	0.4	Consistently above average concentrations at Site 126
	Turbidity ntu	3.5	6.4	1.0	Consistently above average concentrations at Site 126
Biology	**E.Coli** /100ml	825	2419	18	Above average or high at Site 126, average[1] at Site 125
	Benthic Macs	Low scores at Site 126 (low diversity, 1 EPT, only 85 individuals in sample), average[1] scores at Site 125			
	Diatoms	Low scores at Site 126 (no *Cymbella*), average[1] scores at Site 125			

[1] values for this parameter are similar to the median scores for the other 2006 Phase 1 watersheds

Discussion: Site 126 consistently has elevated nutrient concentrations and above average total suspended solids and turbidity. In addition, bacteria concentrations are chronically poor as well. As a result, water quality scores and aquatic life scores are low. Sediment scores have been steadily declining since 2000. Overall scores appear to be dropping in Fort Branch since 2000 as well. Aquatic life appears to be better this year than previous years, but still remain low compared to the rest of the 2006 watersheds. The headwater site (Site 126) is downstream of an area that has high impervious cover and is densely utilized by commercial and industrial land use.

Sub-index scores for Fort Branch Sites (upstream to downstream) 2000, 2003, 2006

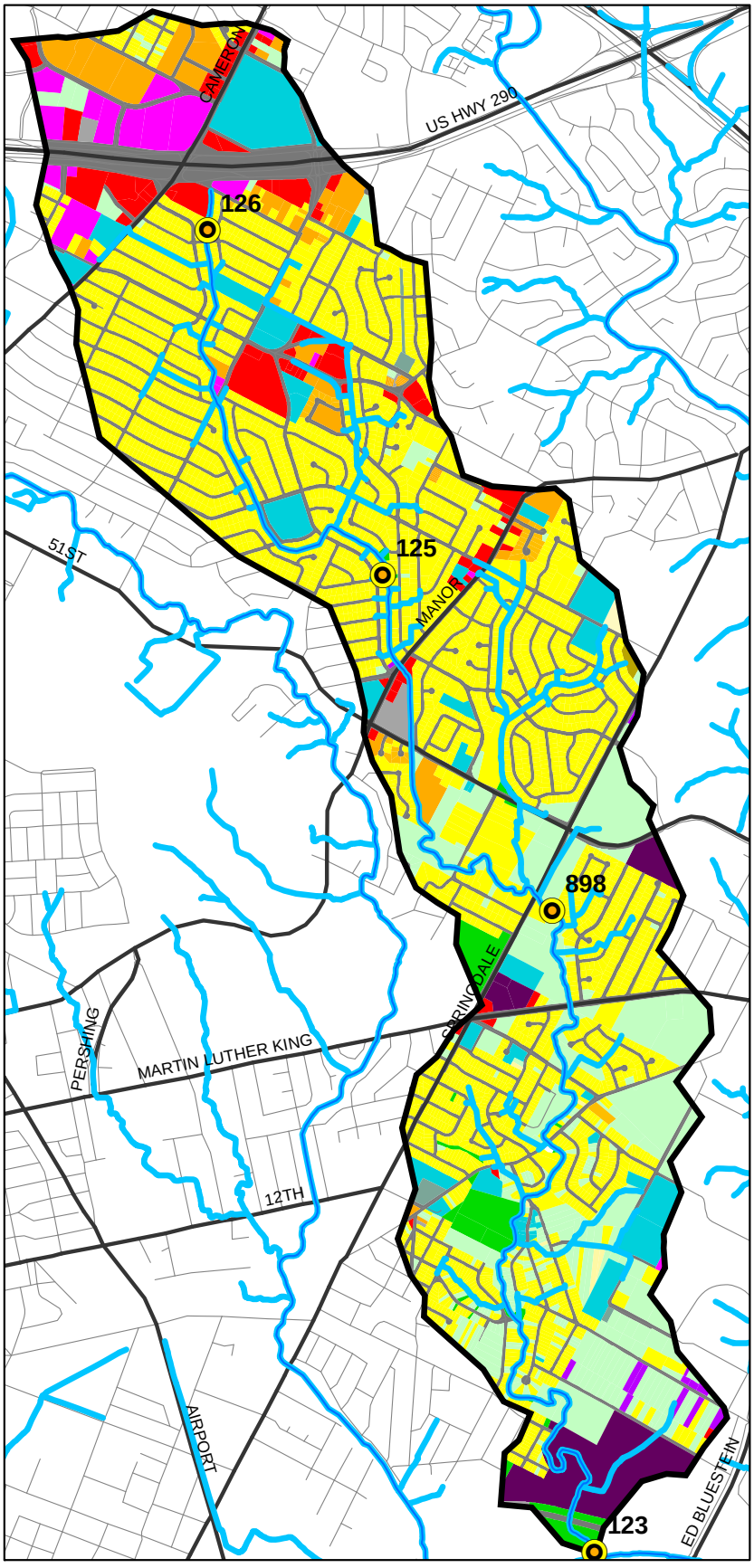
Site Number	Site 126			Site 125			Site 898			Site 123		
Year of Sampling	2000	2003	2006	2000	2003	2006	2000	2003	2006	2000	2003	2006
Water Quality	45	33	44	59	54	75	62	49		65	68	
Sediment	88	78	67	88	78	67	88	78	67	88	78	67
Contact Recreation	73	62	25	78	71	60	71	41		86	79	
Non-Contact Rec.	72	73	89	67	75	75	67	60	71	69	74	35
Physical Integrity	43	44	59	33	41	41	39	46	49	31	43	37
Aquatic Life	17	20	42	34	15	66	32	21		37	22	
Benthic Mac.	31	26	39	29	17	62	40	25		31	19	
Diatom	3	14	44	39	12	70	23	16		42	24	
Total EII Score	56	52	54	60	56	64	60	49	47	63	61	35

* sediment samples only collected at the downstream site, blank cells indicate parameter was not collected, blank columns indicate site was dropped

100-87.5 Excellent 87.5-75 V. Good 75-62.5 Good 62.5-50 Fair 50-37.5 Marginal 37.5-25 Poor 25-12.5 Bad 12.5-0 V. Bad

Fort Branch Watershed

Land Use Map



Fort Branch Watershed

- 2000 Sample Site
- 2003 Sample Site
- 2006 Sample Site
- Recharge Zone
- Major Roads
- Creeks
- Single-Family
- Large Lot Single-Family
- Multi-family
- Commercial
- Office
- Industrial
- Mining / Landfill
- Civic
- Golf Course / Agricultural
- Open / Parks / Undeveloped
- Wildlife Preserve
- Transportation / Utilities

0 0.25 0.5 Miles

N

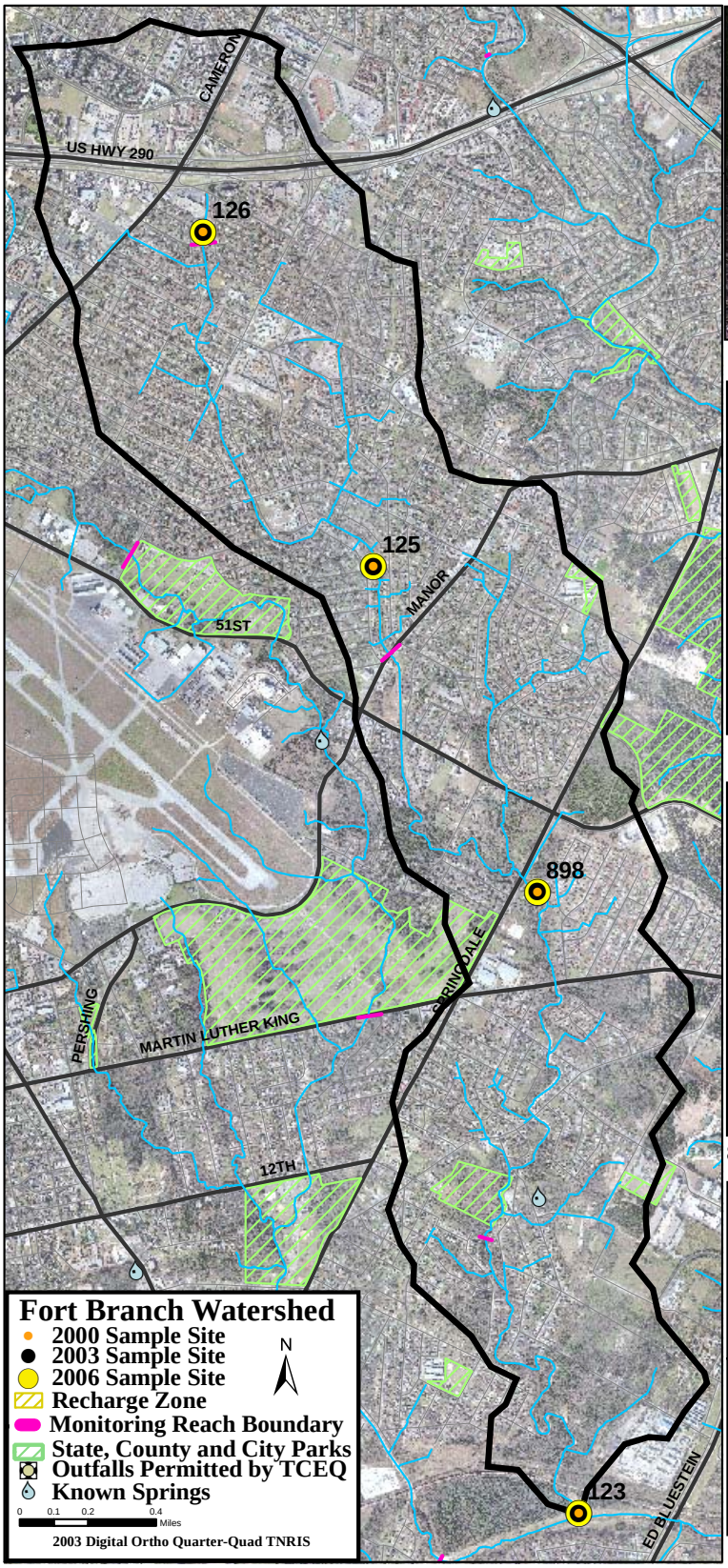
Landuse Coverage Based on 2003 Data

Land Use and Development:

Although the Fort Branch watershed has approximately 38% impervious cover, it has less impervious cover than most urban watersheds. Unstable, sandy streambed and bank substrate has prompted many stream bank stabilization projects. Well known sites in the watershed include Springdale Park and Pecan Springs Park.

Fort Branch Watershed

Aerial Map



126 Fort at Glencrest 07/10/2006

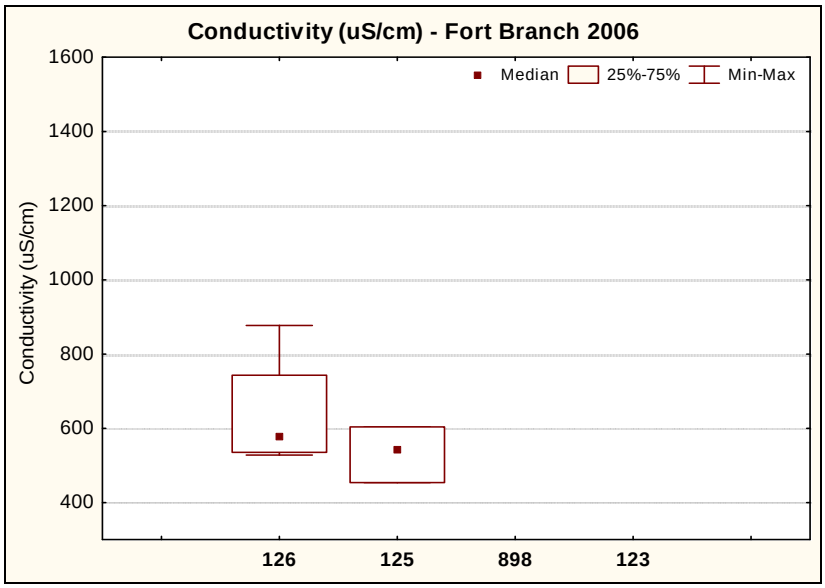
125 Fort above Manor 07/10/2006

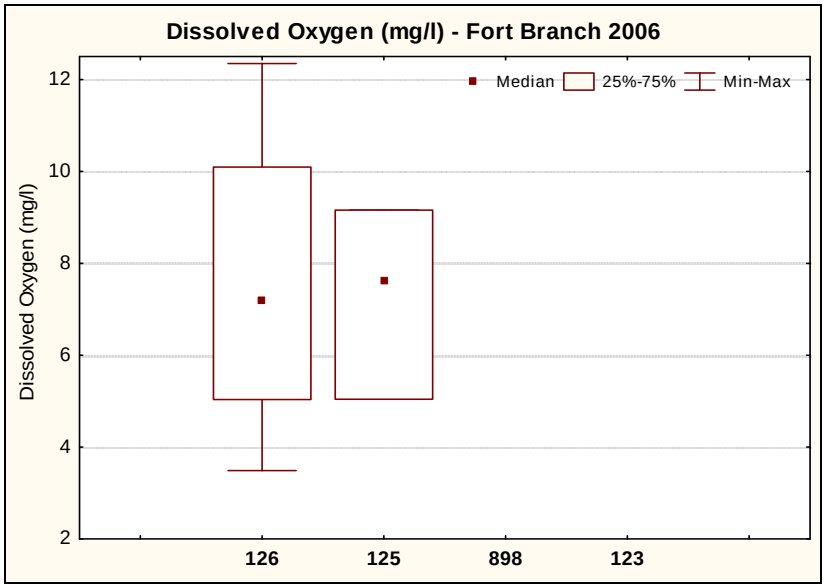
898 Fort at Carson Hill (Single Shot) 07/10/2006

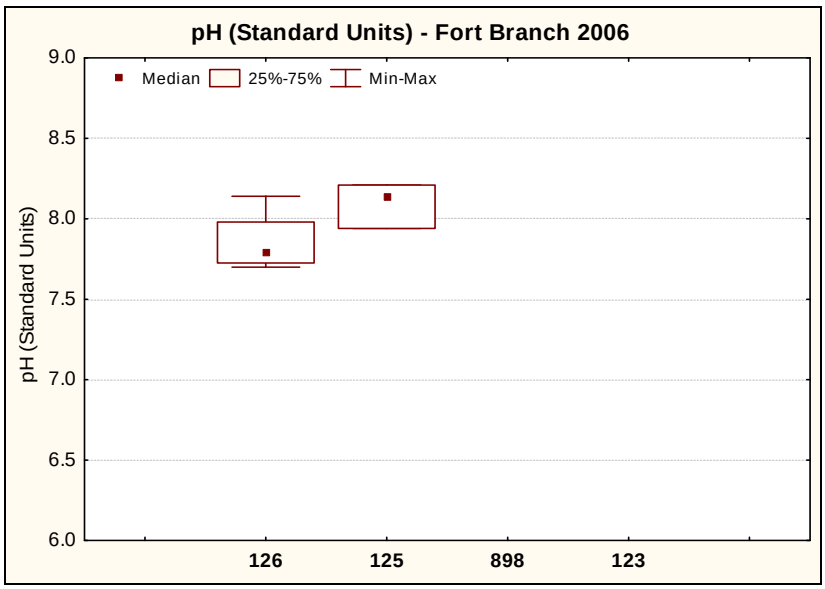
123 Fort at North Boggy 07/06/2006

Fort Branch Watershed

Data Summary Graphs – Field Parameters

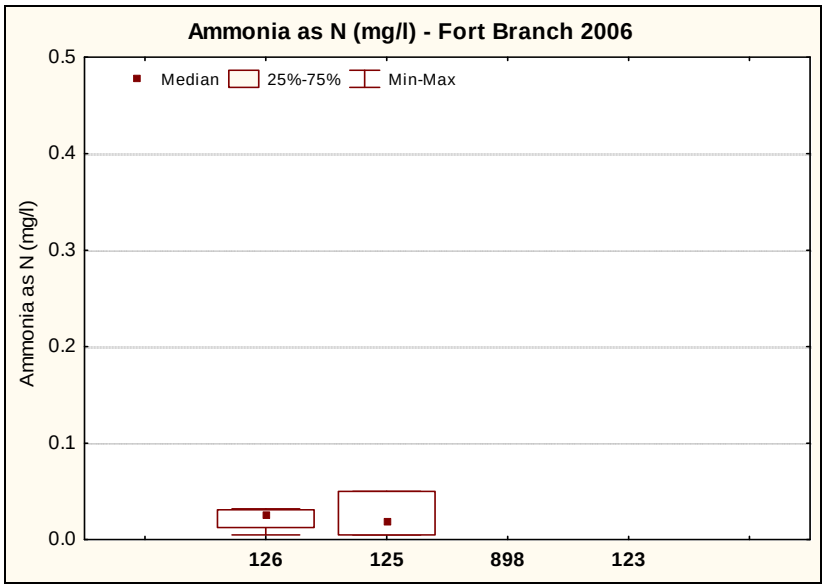


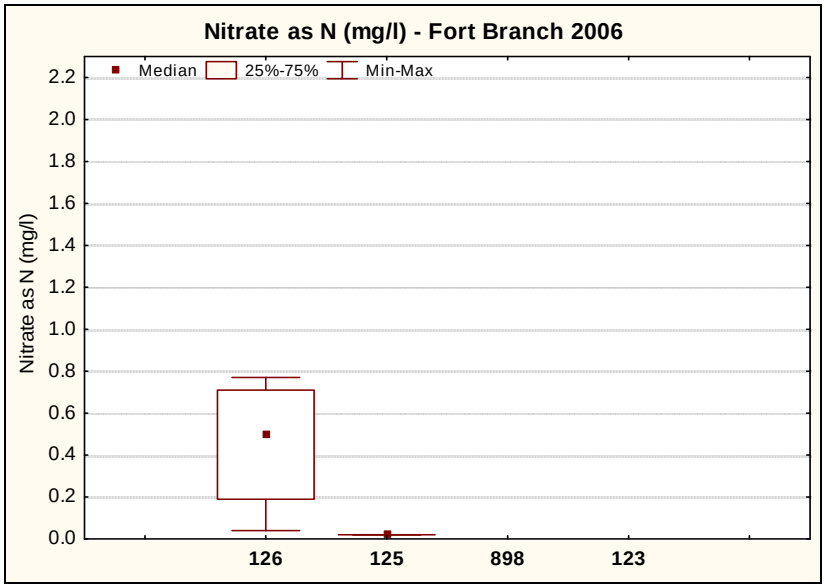


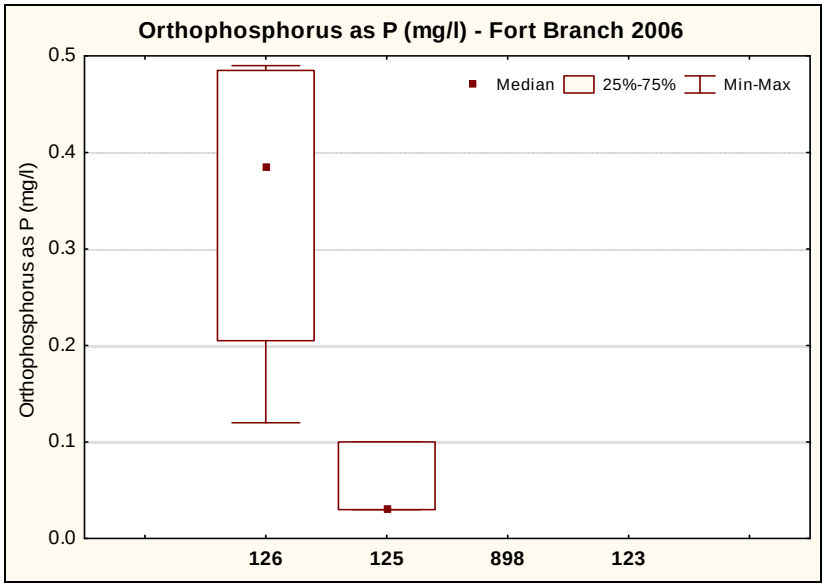


Fort Branch Watershed

Data Summary Graphs - Nutrients

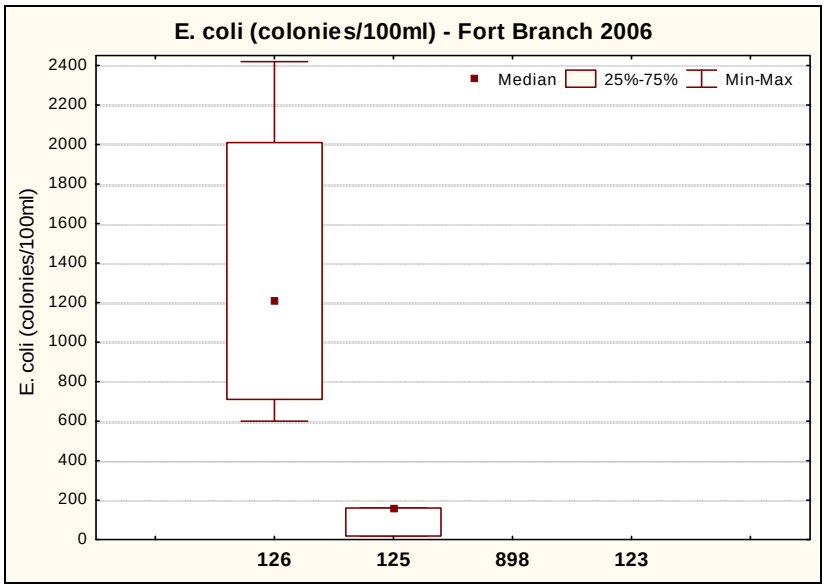


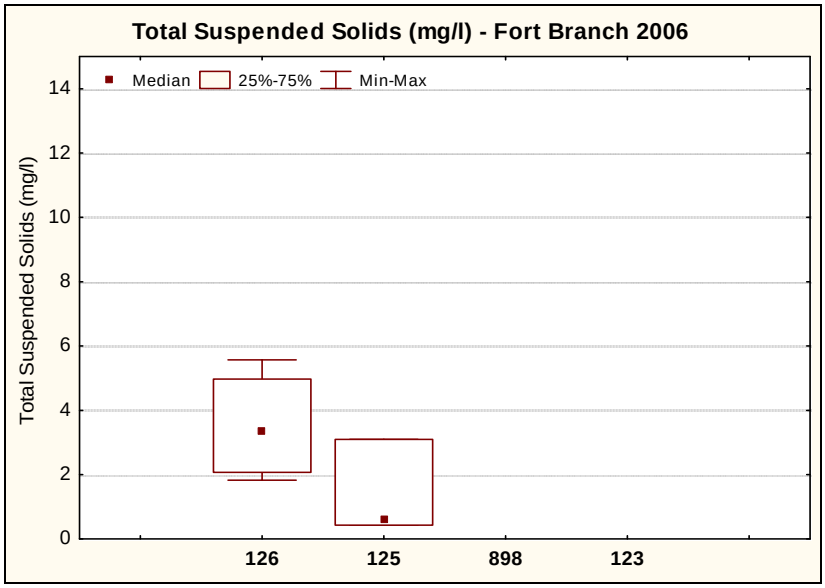


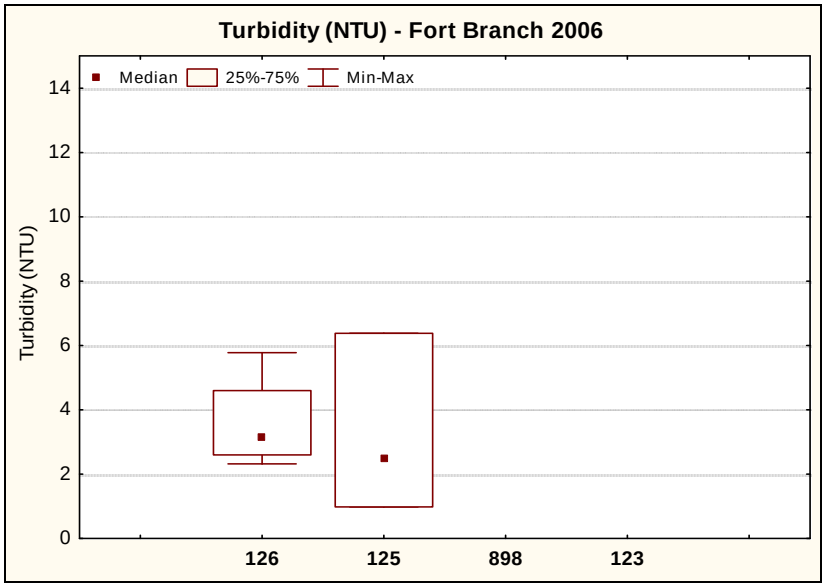


Fort Branch Watershed

Data Summary Graphs – Physical Parameters



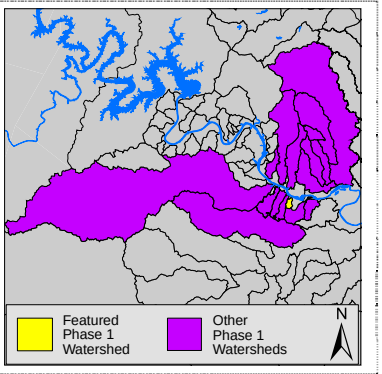




Harpers Branch Watershed

Summary Sheet

Catchment	Total area	1 square miles	
	Area in recharge	none	
	Creek length	1 mile	
	Receiving water	Town Lake	
Demographics	2000 population	2,963	
	2030 projected population	3,316	
	30 year projected % increase	12 %	
Land Use	Impervious cover ('97 crwr data)	53.4 %	
Overall EII Scores	2000	48	
	2003	47	
	2006	46	



Flow Regime* for Sample Sites on Harpers Branch Upstream to Downstream

		2003					2006				
		Feb	Mar	May	Sep	Dec	Feb	May	Jul	Aug	Nov
		19	10-17	14	23	3	22	18	5-12	23	29
Site #	Site Name	WQ	Bio	WQ	WQ	WQ	WQ	WQ	Bio	WQ	WQ
844	Harper's Branch at Woodland Ave	B	B	B	B	B	B	B	B	n	B
484	Harper's Branch at Riverside Drive	B	B	B	B	B					

* B = baseflow conditions n = no flow was present Storm = storm flow was present
Blue = Samples were taken Grey = Samples were not taken Blank = site not visited

	Parameter	Mean	Max	Min	Relative concentrations compared to other 2006 Phase 1 watersheds
Physicochemical	**D.O.** mg/l	3.8	4.9	2.8	Chronically low
	pH st.units	7.07	7.24	6.86	Consistently below average
	Cond uS/cm	856	933	786	High
	SO_4 mg/l	58.4	65.0	52.0	Average[1]
Nutrients	**NH_3** mg/l	0.02	0.03	0.01	Average[1]
	NO_3 mg/l	0.92	1.37	0.38	Above average with a high concentration in May
	Ortho P mg/l	0.06	0.09	0.02	Average[1]
Sediment Load	**TSS** mg/l	2.2	2.9	1.6	Average[1]
	Turbidity ntu	1.7	2.3	1.3	Average[1]
Biology	**E.Coli** /100ml	1,492	3,300	76	High concentration in February, above average in May
	Benthic Macs	Poor for all parameters (no EPT, only one intolerant taxa, low diversity) only 85 individuals in sample			
	Diatoms	Below average. Low scores for *Cymbella* richness and % sim.to ref. Avg scores for diversity and %motile			

[1] values for this parameter are similar to the median scores for the other 2006 Phase 1 watersheds

Discussion: Contact recreation scores were low due to chronically elevated bacteria levels in 2006. In addition, the contact recreation scores have been steadily decreasing since 2000. Although the 2006 sub-index scores for aquatic life at Site 844 were better than previous years, they were still below average compared to the rest of the Phase I watersheds.

Sub-index scores for Harpers Branch Sites (upstream to downstream) 2000, 2003, 2006

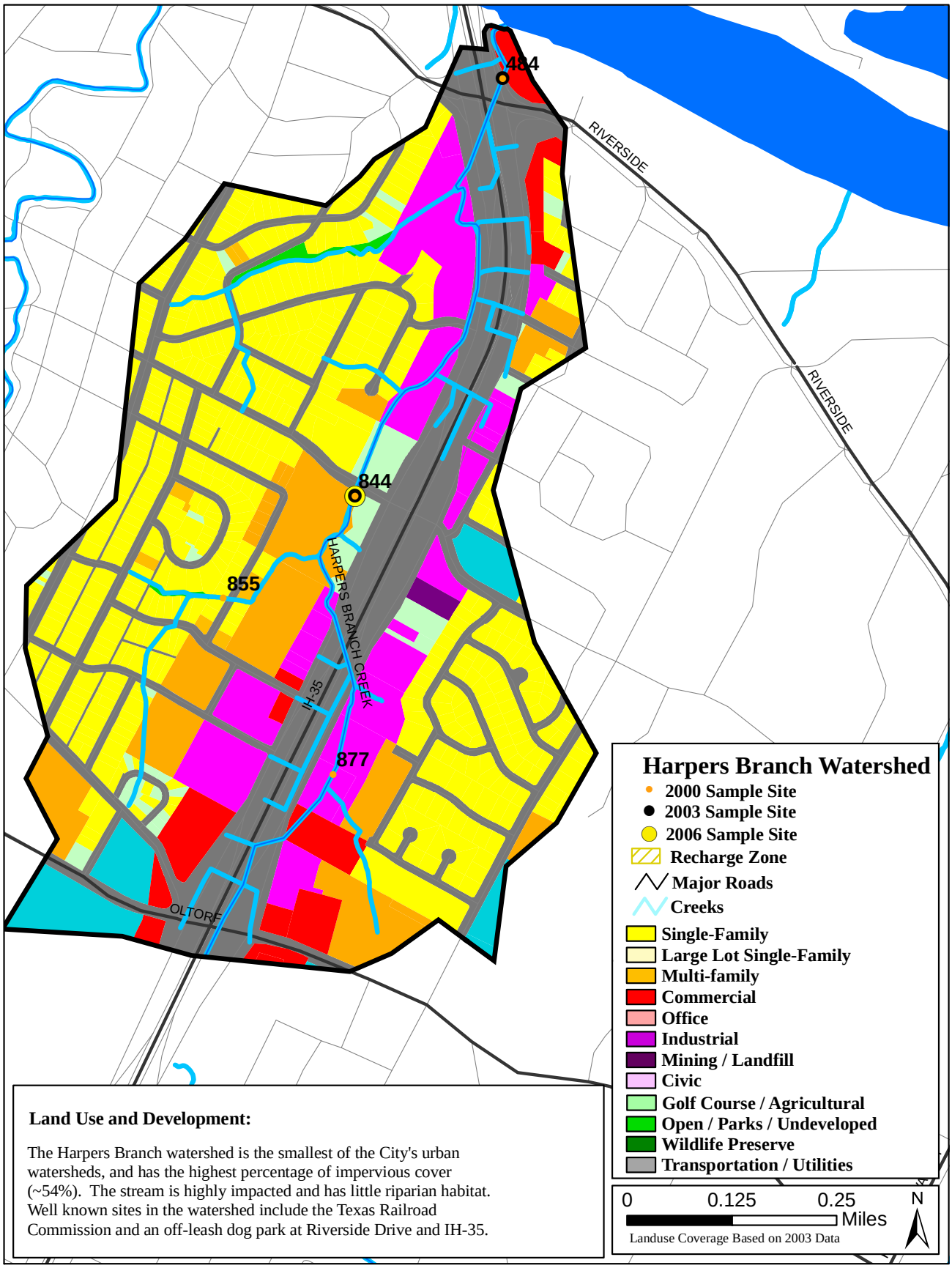
Site Number	Site 844			Site 484		
Year of Sampling	2000	2003	2006	2000	2003	2006
Water Quality	41	45	39	46	46	
Sediment	59	57	51	59	57	
Contact Recreation	67	47	33	63	70	
Non-Contact Rec.	79	65	66	57	31	
Physical Integrity	38	56	46	27	36	
Aquatic Life	22	33	43	30	19	
Benthic Mac.	27	30	26	29	19	
Diatom	16	35	60	31	18	
Total EII Score	51	51	46	47	43	

* sediment samples only collected at the downstream site, blank cells indicate parameter was not collected, blank columns indicate site was dropped

100-87.5 Excellent 87.5-75 V. Good 75-62.5 Good 62.5-50 Fair 50-37.5 Marginal 37.5-25 Poor 25-12.5 Bad 12.5-0 V. Bad

Harpers Branch Watershed

Land Use Map

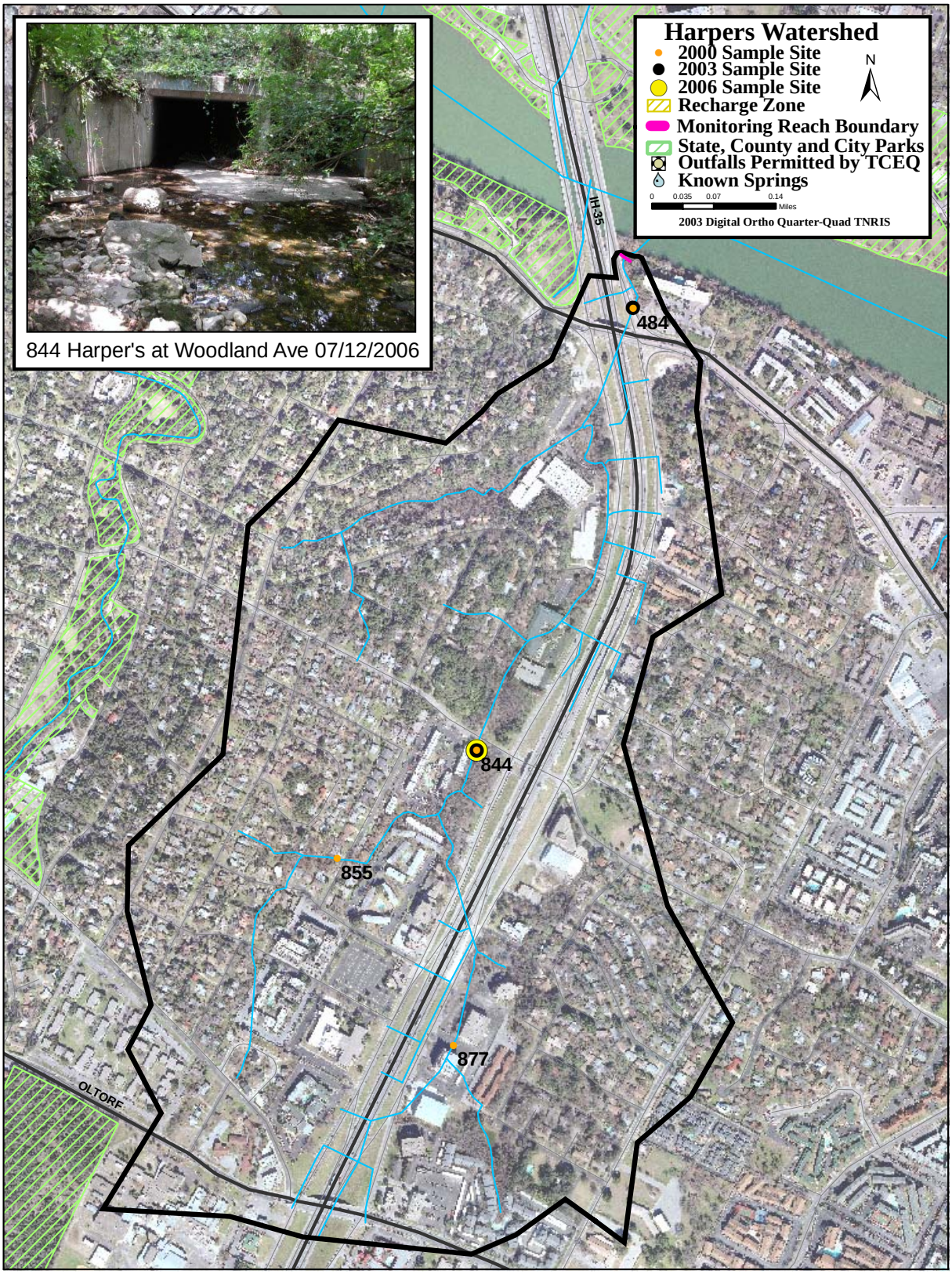


Land Use and Development:

The Harpers Branch watershed is the smallest of the City's urban watersheds, and has the highest percentage of impervious cover (~54%). The stream is highly impacted and has little riparian habitat. Well known sites in the watershed include the Texas Railroad Commission and an off-leash dog park at Riverside Drive and IH-35.

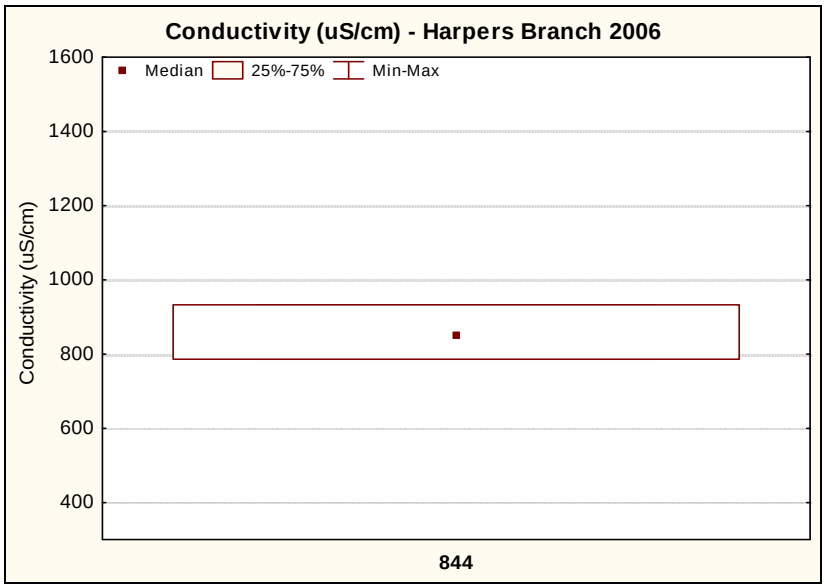
Harpers Branch Watershed

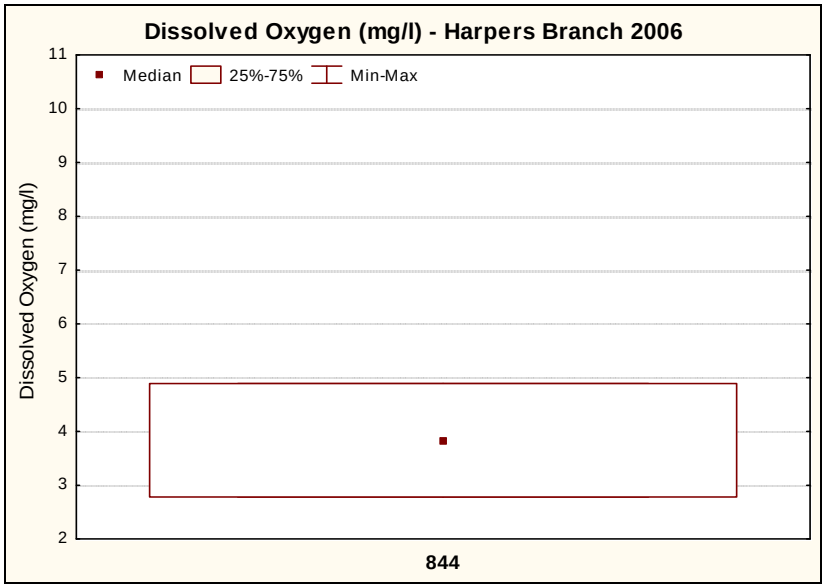
Aerial Map

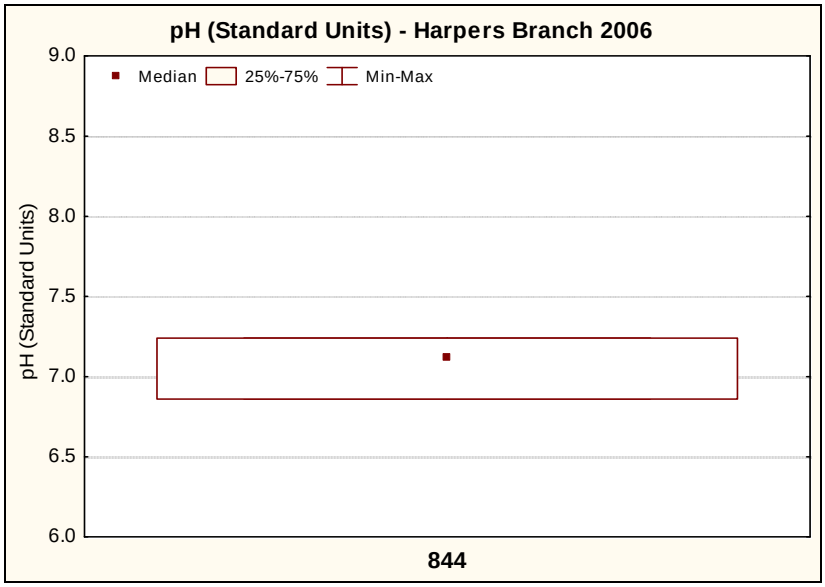


Harpers Branch Watershed

Data Summary Graphs – Field Parameters

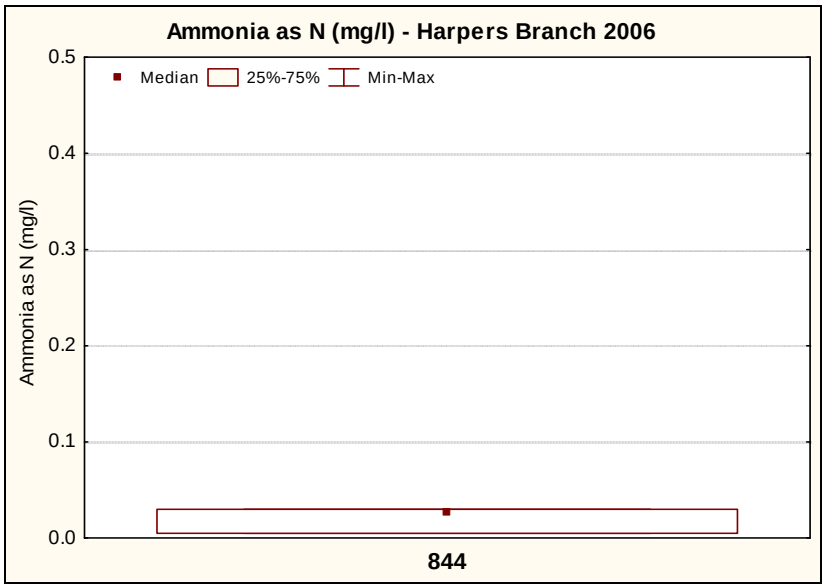


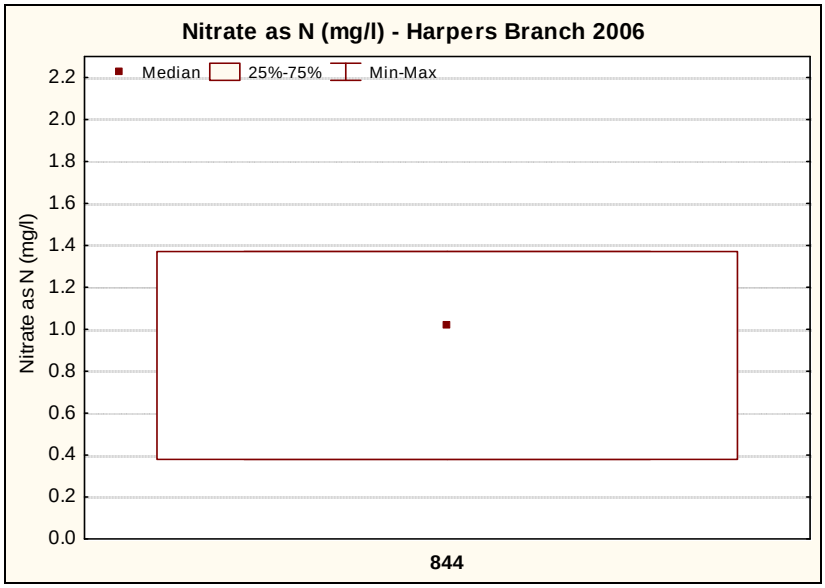


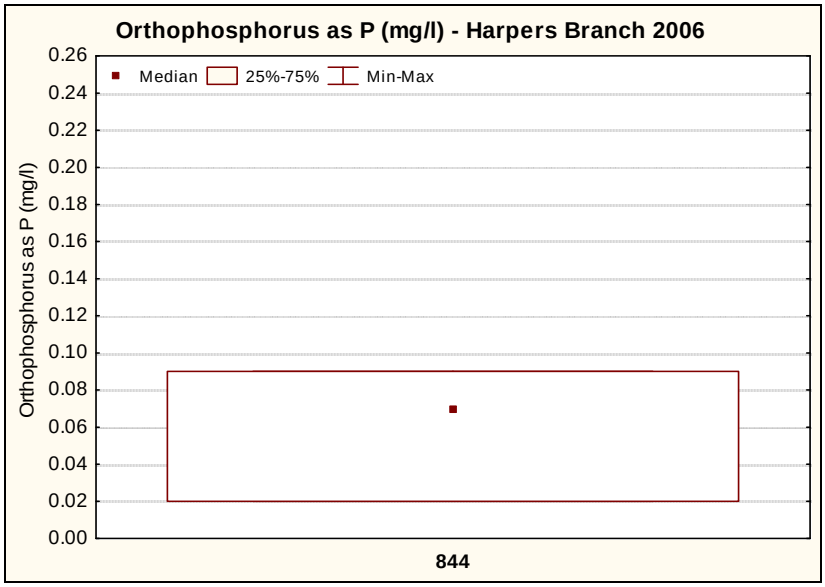


Harpers Branch Watershed

Data Summary Graphs - Nutrients

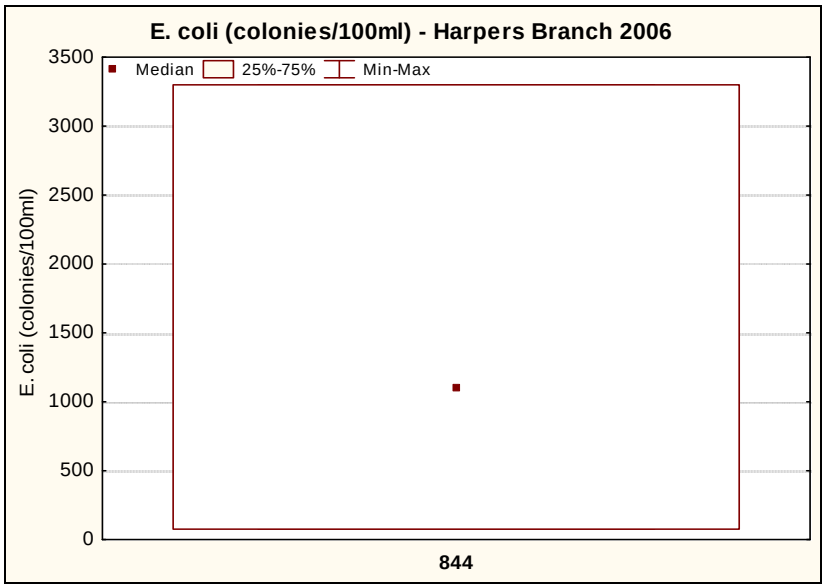


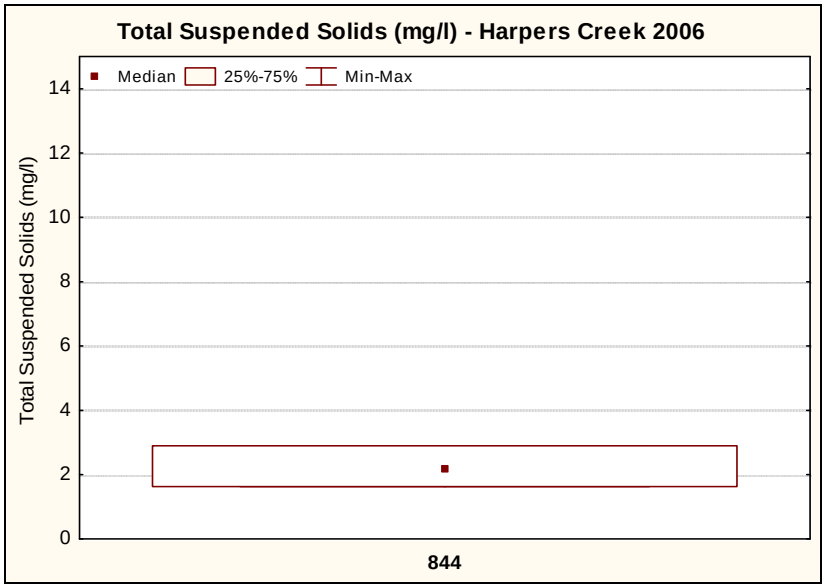


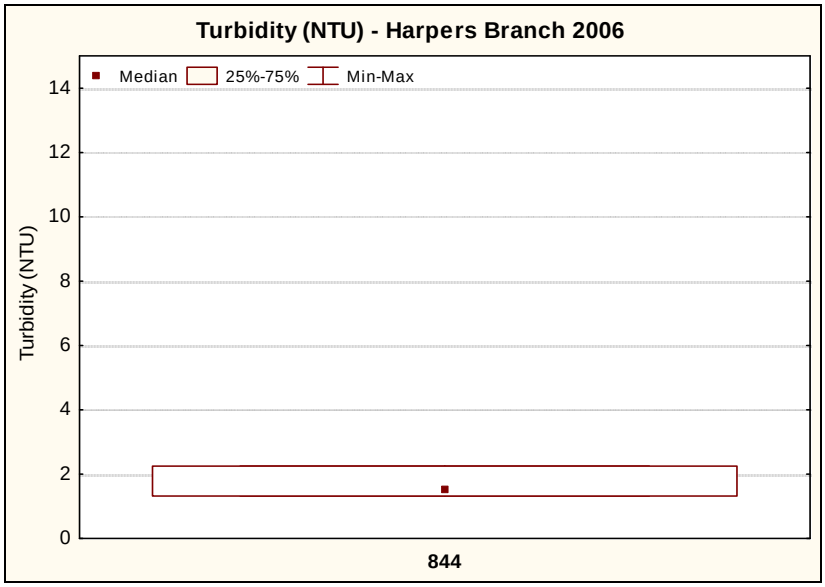


Harpers Branch Watershed

Data Summary Graphs – Physical Parameters



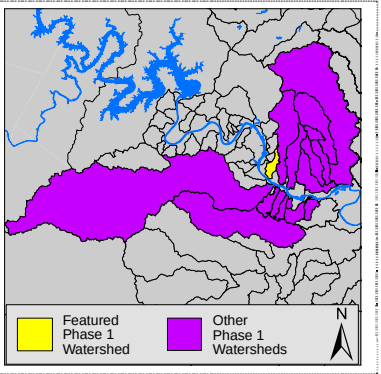




Johnson Creek Watershed

Summary Sheet

Catchment	Total area	2 square miles	
	Area in recharge	1.9 square miles	
	Creek length	3 miles	
	Receiving water	Town Lake	
Demographics	2000 population	7,655	
	2030 projected population	10,820	
	30 year projected % increase	41 %	
Land Use	Impervious cover ('97 crwr data)	44.1 %	
Overall EII Scores	2000	53	
	2003	56	
	2006	47	



Flow Regime* for Sample Sites on Johnson Creek Upstream to Downstream

		2003					2006				
		Feb	Mar	May	Sep	Dec	Feb	May	Jul	Aug	Nov
		19	10-17	14	23	3	22	18	5-12	23	29
Site #	Site Name	WQ	Bio	WQ	WQ	WQ	WQ	WQ	Bio	WQ	WQ
847	Johnson at S. Tarrytown	B	B	B	B	B					
897	Johnson at Woodmont	n	B	n	n	n	n	B	B	n	B

* B = baseflow conditions n = no flow was present Storm = storm flow was present
Blue = Samples were taken Grey = Samples were not taken Blank = site not visited

	Parameter	Mean	Max	Min	Relative concentrations compared to other 2006 Phase 1 watersheds
Physicochemical	**D.O.** mg/l	2.9	5.3	0.6	Consistently low. Lowest concentration in Nov when sewer leak identified
	pH st.units	7.47	7.63	7.30	Slightly below average
	Cond uS/cm	610	610	609	Average[1]
	SO_4 mg/l	72.2	76.4	67.9	Above average concentrations
Nutrients	**NH_3** mg/l	0.23	0.43	0.03	One very high concentration in November, other sample average[1]
	NO_3 mg/l	0.23	0.40	0.05	Average[1]
	Ortho P mg/l	0.45	0.47	0.43	Highest mean of any site in 2006
Sediment Load	**TSS** mg/l	6.0	6.3	5.7	High
	Turbidity ntu	11.2	16.7	5.7	High
Biology	**E.Coli** /100ml	3629	4839	2419	Very high, sewer leak identified, referred to Spills Team for resolution
	Benthic Macs	Below average scores for most metric parameters and only 33 individuals in sample (low EPT & diversity)			
	Diatoms	Average[1]. Pollution tolerance was above average, while % similarity to reference was below average.			

[1] values for this parameter are similar to the median scores for the other 2006 Phase 1 watersheds

Discussion: Total suspended solids and turbidity levels appear to be chronically high at Johnson Creek sites. Bacteria concentrations were very high at Site 897. The surface water team notified the Spills Team of a suspected leaking sewer line upstream of Site 897 during one of the sample events. The investigation revealed that a residential wastewater line had been connected to a storm drain for several years. This site also showed a very interesting phenomenon: 60% of the diatoms were from fossil sources and were more typical of very large lakes, (no chloroplasts present, planktonic, very large and centric shaped). The diatomist (Barbara Winsborough) postulates that the source may be from diatomaceous earth (or D.E) and that the large concentration indicates a nearby swimming pool filter may have been back-flushed into a storm drain not long before the sample was taken. D.E. is also used as flea control on pets and in yards; however it is unclear how this method of application could result in the high concentrations observed. The diatom scores were not impacted from this anomaly, since the fossil genera were exempted from the specie list.

Sub-index scores for Johnson Creek Sites (upstream to downstream) 2000, 2003, 2006

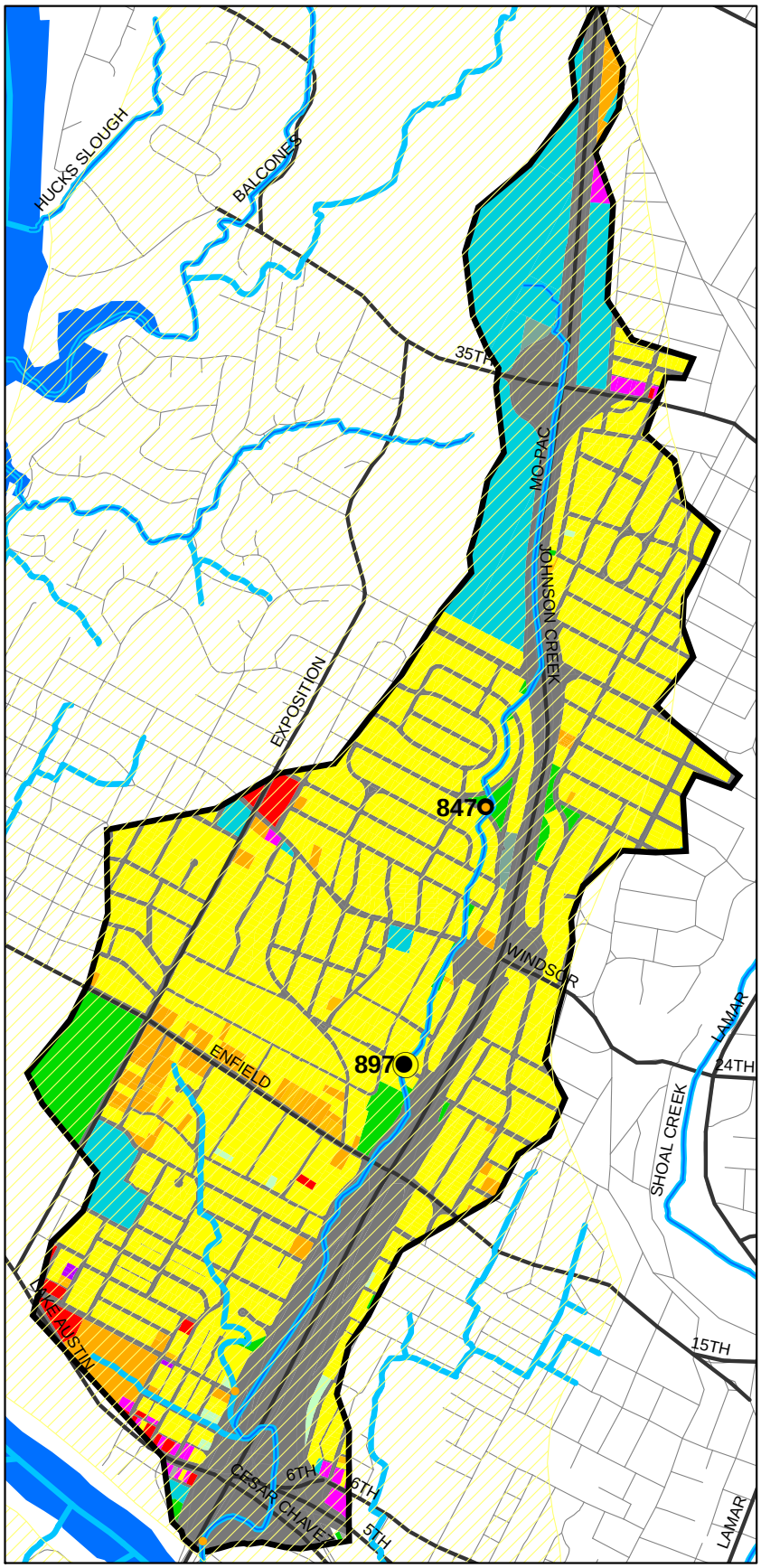
Site Number	Site 847			Site 897		
Year of Sampling	2000	2003	2006	2000	2003	2006
Water Quality	43	49				44
Sediment	82	60			60	65
Contact Recreation	70	53				24
Non-Contact Rec.	87	71			75	49
Physical Integrity	43	57			57	45
Aquatic Life	34	39			33	55
Benthic Mac.	47	61			37	36
Diatom	20	16			28	73
Total EII Score	60	55			56	47

* sediment samples only collected at the downstream site, blank cells indicate parameter was not collected, blank columns indicate site was dropped

100-87.5 Excellent 87.5-75 V. Good 75-62.5 Good 62.5-50 Fair 50-37.5 Marginal 37.5-25 Poor 25-12.5 Bad 12.5-0 V. Bad

Johnson Creek Watershed

Land Use Map



Johnson Creek Watershed

- 2000 Sample Site
- 2003 Sample Site
- 2006 Sample Site
- Recharge Zone
- Major Roads
- Creeks
- Single-Family
- Large Lot Single-Family
- Multi-family
- Commercial
- Office
- Industrial
- Mining / Landfill
- Civic
- Golf Course / Agricultural
- Open / Parks / Undeveloped
- Wildlife Preserve
- Transportation / Utilities

0 0.25 0.5 Miles

N

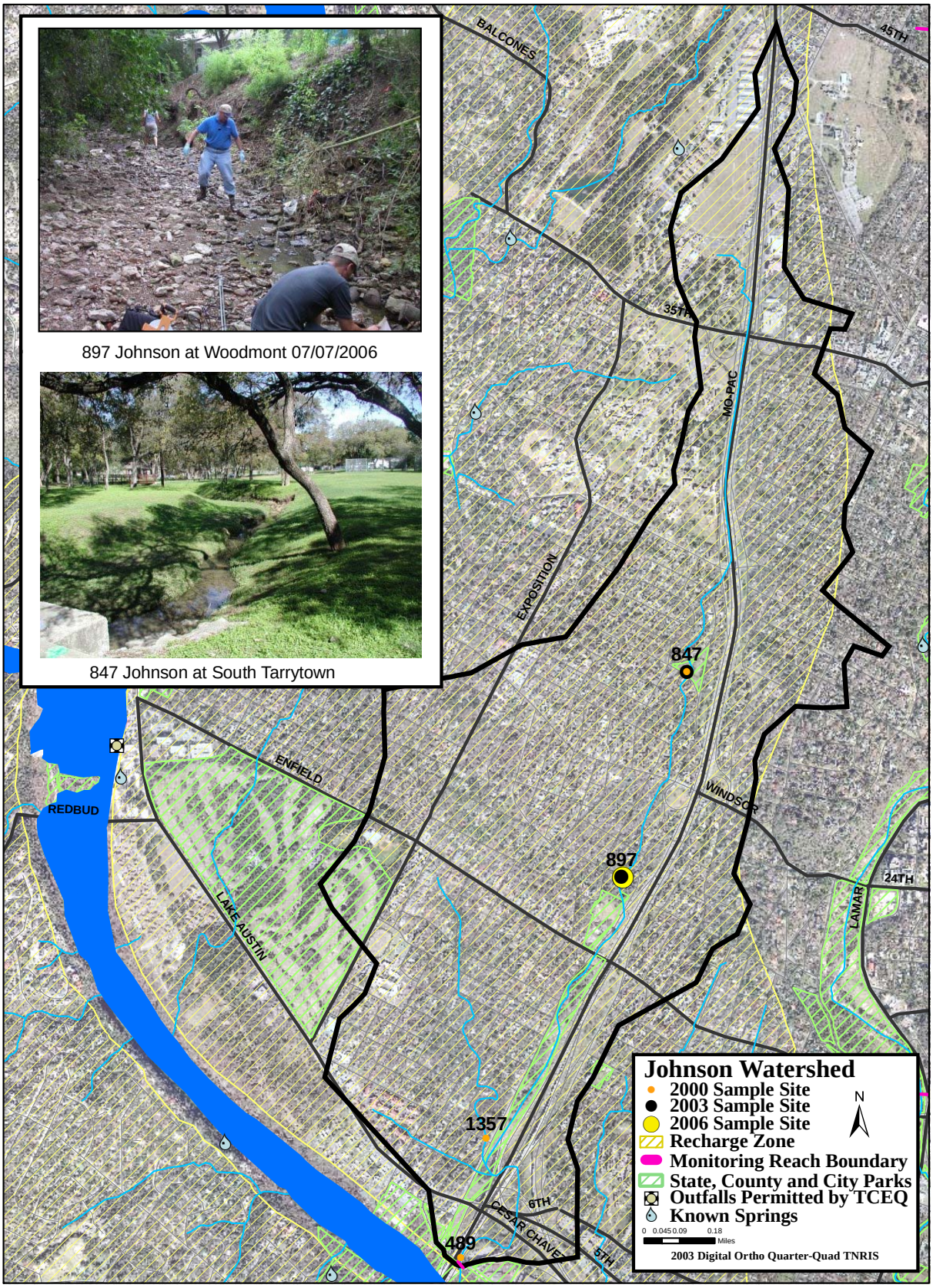
Landuse Coverage Based on 2003 Data

Land Use and Development:

The majority of the Johnson Creek watershed is in the recharge zone of the Northern Edwards Aquifer. Although densely developed (53%) as single family land use, approximately one third of the land use is classified as roadways, a large portion of which is Loop 1. Well known sites include Camp Mabry, Tarrytown Park, Westenfield Park, and the Johnson Creek Greenbelt. Dense residential development near creek banks has resulted in poor riparian buffers.

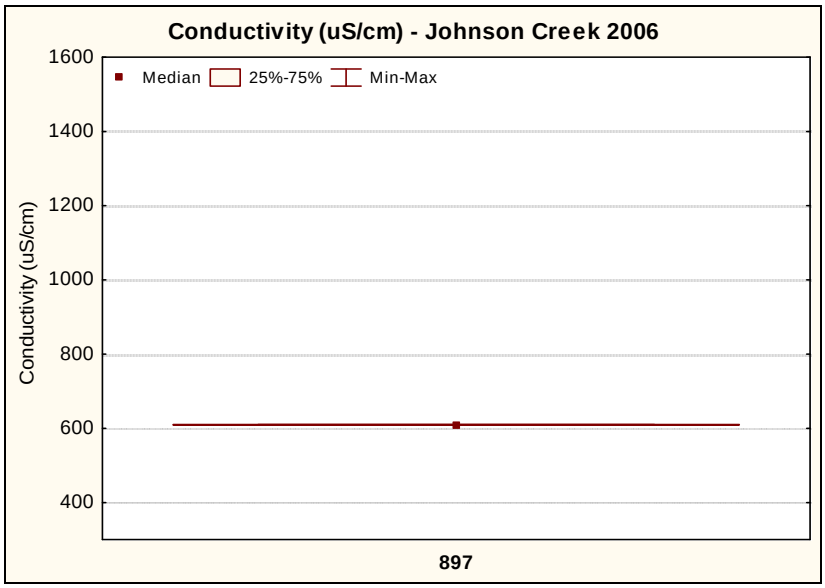
Johnson Creek Watershed

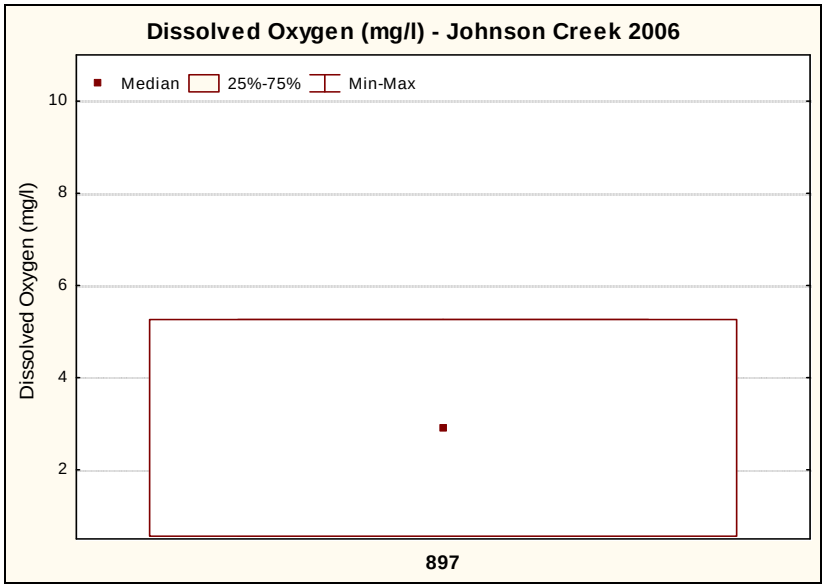
Aerial Map

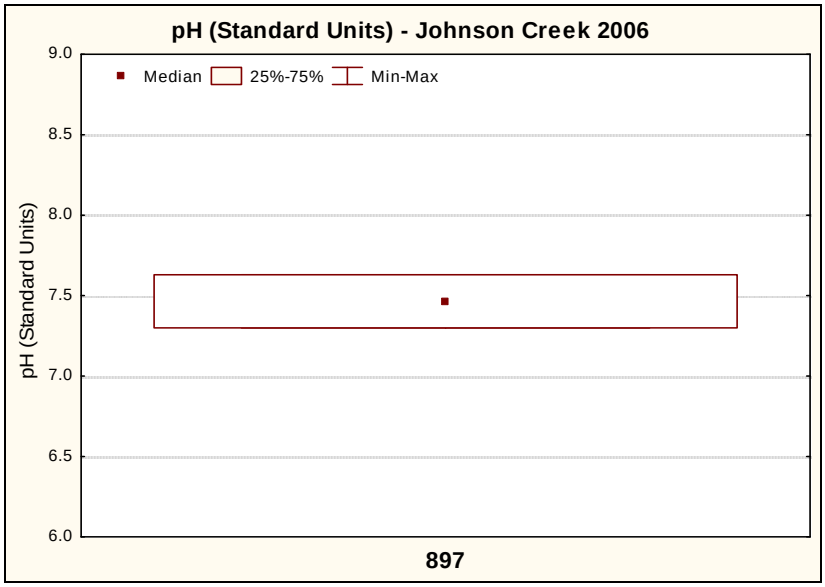


Johnson Creek Watershed

Data Summary Graphs – Field Parameters

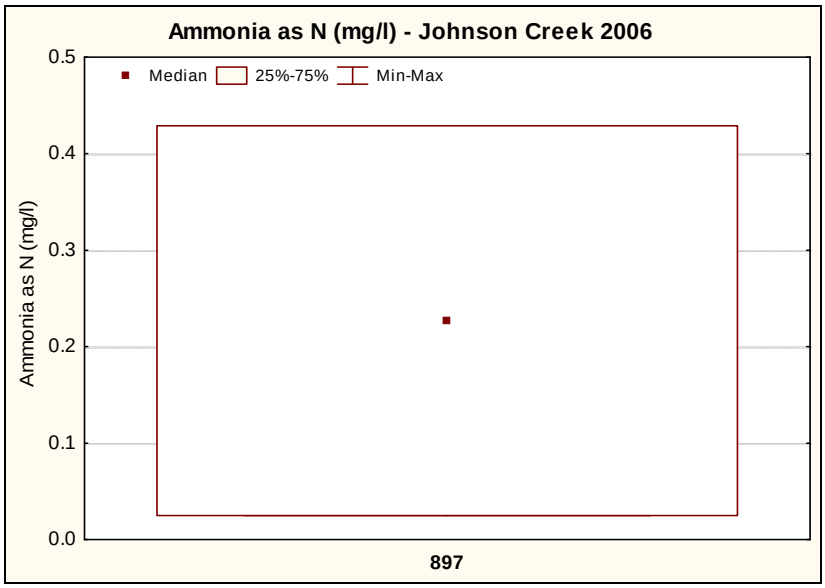


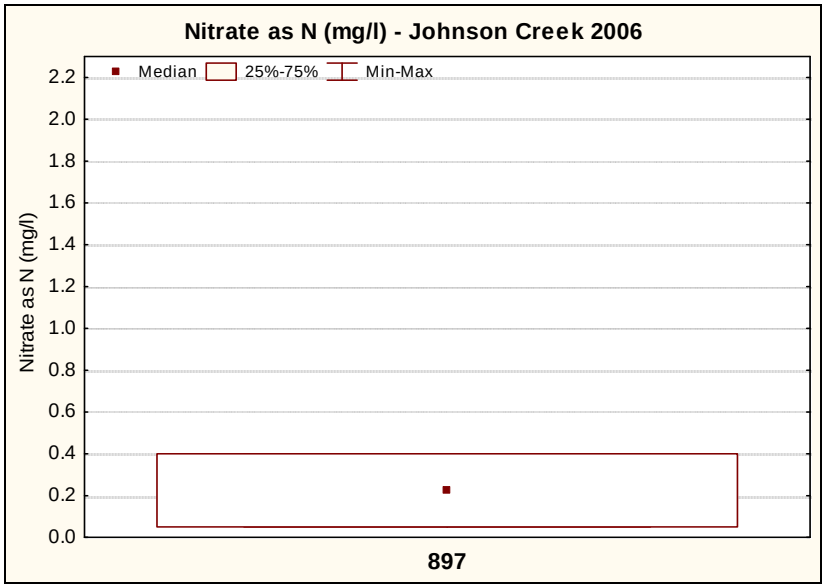


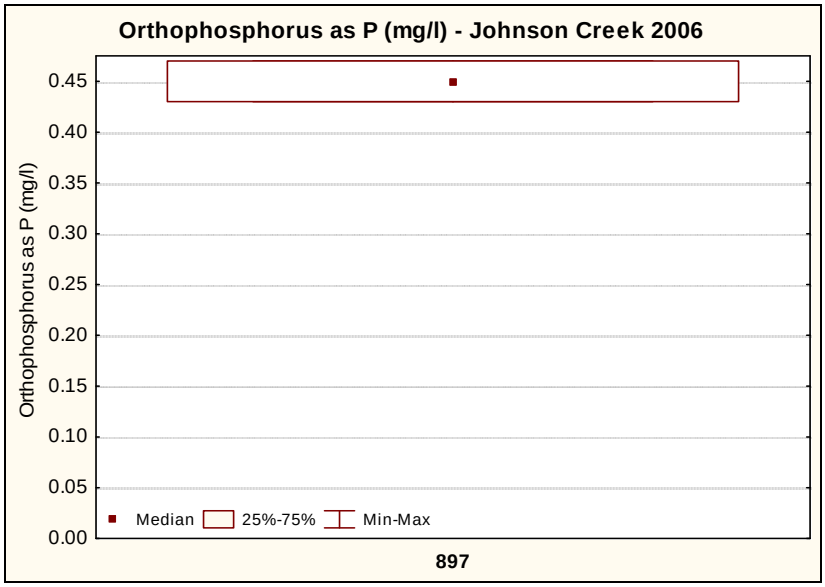


Johnson Creek Watershed

Data Summary Graphs – Nutrients

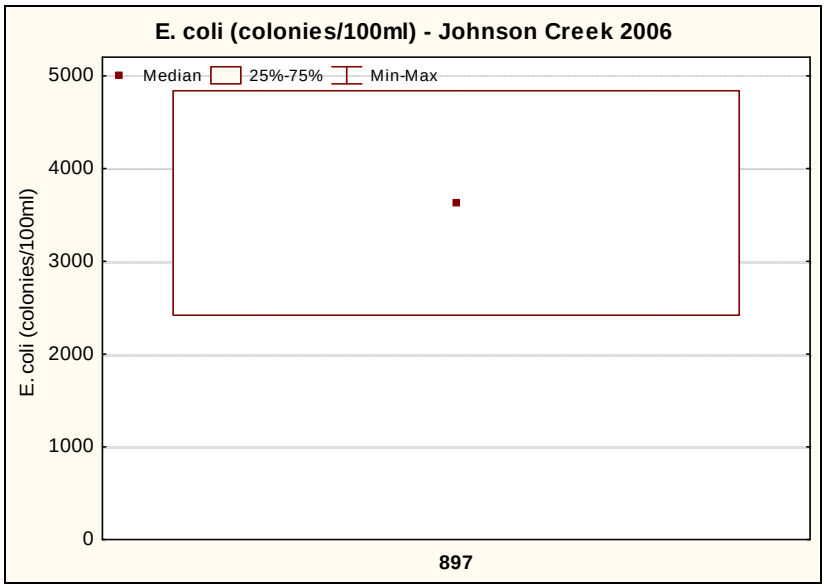


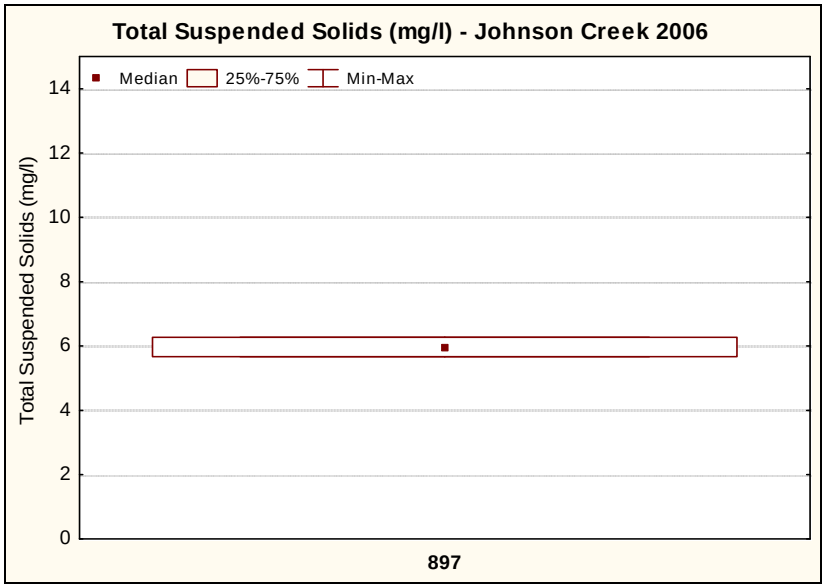


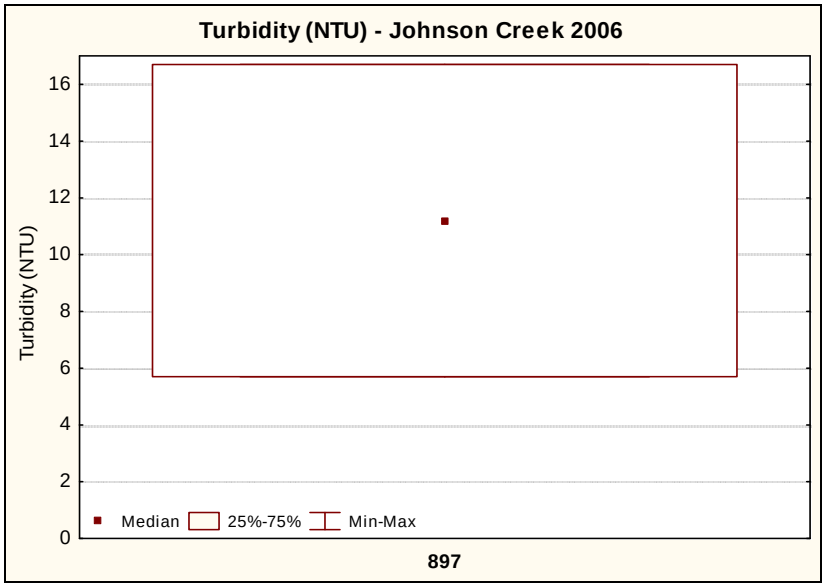


Johnson Creek Watershed

Data Summary Graphs – Physical Parameters



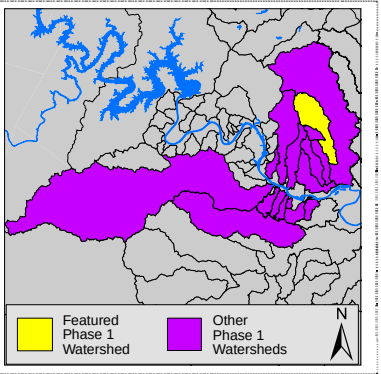




Little Walnut Creek Watershed

Summary Sheet

Catchment	Total area	11 square miles	
	Area in recharge	none	
	Creek length	9 miles	
	Receiving water	Walnut Creek	
Demographics	2000 population	63,827	
	2030 projected population	69,571	
	30 year projected % increase	9 %	
Land Use	Impervious cover ('97 crwr data)	44.7 %	
Overall EII Scores	2000	**70**	
	2003	**63**	
	2006	**67**	



Flow Regime* for Sample Sites on Little Walnut Creek Upstream to Downstream

		2003					2006				
		Feb 19	Mar 10-17	May 14	Sep 23	Dec 3	Feb 22	May 18	Jul 5-12	Aug 23	Nov 29
Site #	Site Name	WQ	Bio	WQ	WQ	WQ	WQ	WQ	Bio	WQ	WQ
838	Little Walnut at Golden Meadow	B	B	B	B	B	B	B	B	n	B
3860	Little Walnut at Georgian						B	B	B	B	B
839	Little Walnut at Hermitage Drive	B	B	B	B	B					
3857	Little Walnut at Cameron						B	B	B	B	B
840	Little Walnut at US290	B	B	B	B	B					
634	Little Walnut at US 183	B	B	B	B	B	B	B	B	B	B

* B = baseflow conditions n = no flow was present Storm = storm flow was present
Blue = Samples were taken Grey = Samples were not taken Blank = site not visited

	Parameter	Mean	Max	Min	Relative concentrations compared to other 2006 Phase 1 watersheds
Physicochemical	**D.O.** mg/l	9.8	14.5	7.1	Sites 838 and 3860 were consistently elevated, other sites were average[1]
	pH st.units	8.15	9.93	7.78	Average[1], with one high value at Site 3857 in August
	Cond uS/cm	603	704	488	Average[1] , with a slight decreasing trend downstream
	SO_4 mg/l	43.9	59.1	33.6	Average[1]
Nutrients	**NH_3** mg/l	0.02	0.05	0.01	Average[1]
	NO_3 mg/l	0.43	1.58	0.02	Above average or high values in May, other samples typically average[1]
	Ortho P mg/l	0.03	0.08	0.02	Average[1]
Sediment Load	**TSS** mg/l	1.5	6.1	0.5	One high value in August at Site 3860, other sites average[1]
	Turbidity ntu	1.5	3.1	0.6	Sites 634 and 838 slightly above average
Biology	**E.Coli** /100ml	578	2,600	27	Site 838 consistently high, other sites average[1]
	Benthic Macs	Above average metric scores at Site 634. Below average scores at Site 838 (low EPT, low diversity)			
	Diatoms	Sites consistently had high *Cymbella* richness and low motile taxa. No diatoms were present at Site 634.			

[1] values for this parameter are similar to the median scores for the other 2006 Phase 1 watersheds

Discussion: Contact recreation scores have steadily decreased at all sites since 2000 due to increasing bacteria concentrations. During 2006, the headwater site (Site 838) had consistently high bacteria levels. Total EII site scores and aquatic life scores generally increase in quality in a downstream trend. The diatom score for the mouth site (Site 634) has been left blank since there were no diatoms present in the sample. It is unclear whether this reflects the true aquatic community, or if there was operator error.

Sub-index scores for Little Walnut Creek Sites (upstream to downstream) 2000, 2003, 2006

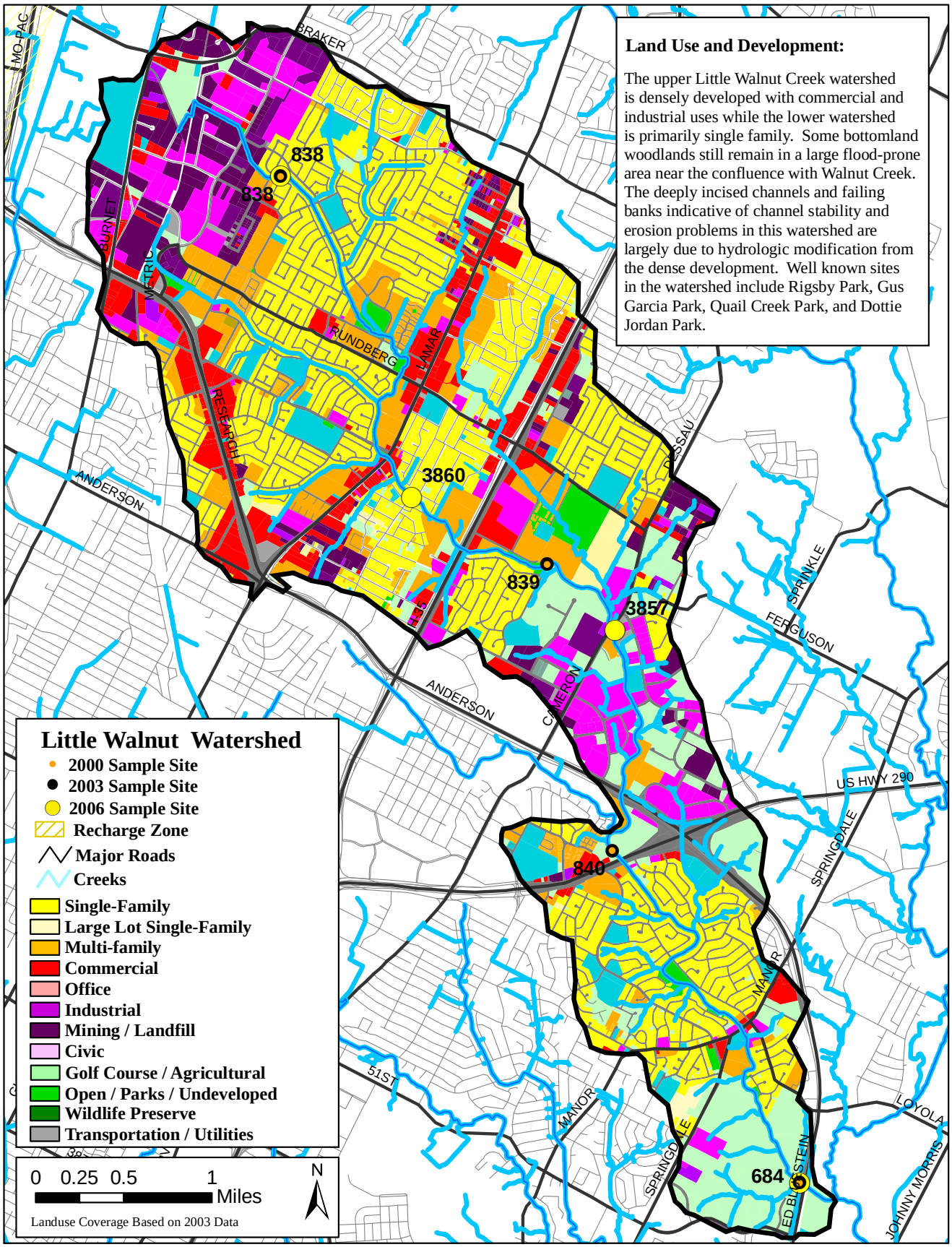
Site Number	Site 838			Site 3860			Site 839			Site 3857			Site 840			Site 634		
Year of Sampling	2000	2003	2006	2000	2003	2006	2000	2003	2006	2000	2003	2006	2000	2003	2006	2000	2003	2006
Water Quality	54	54	51			63	67	57				67	70	58		75	55	67
Sediment	92	75	80			80	92	75				80	92	75		92	75	80
Contact Recreation	71	33	25			55	91	78				68	90	72		89	79	63
Non-Contact Rec.	62	58	72			72	64	73				73	83	77		84	60	73
Physical Integrity	31	48	55			53	31	53				49	55	67		35	58	45
Aquatic Life	75	54	71			83	68	59				82	67	48		54	71	91
Benthic Mac.	91	61	61			82	64	66				81	64	50		49	75	91
Diatom	59	46	80			84	71	52				82	69	46		58	67	
Total EII Score	64	54	59			68	69	66				70	76	66		72	66	70

* sediment samples only collected at the downstream site, blank cells indicate parameter was not collected, blank columns indicate site was dropped

100-87.5 Excellent 87.5-75 V. Good 75-62.5 Good 62.5-50 Fair 50-37.5 Marginal 37.5-25 Poor 25-12.5 Bad 12.5-0 V. Bad

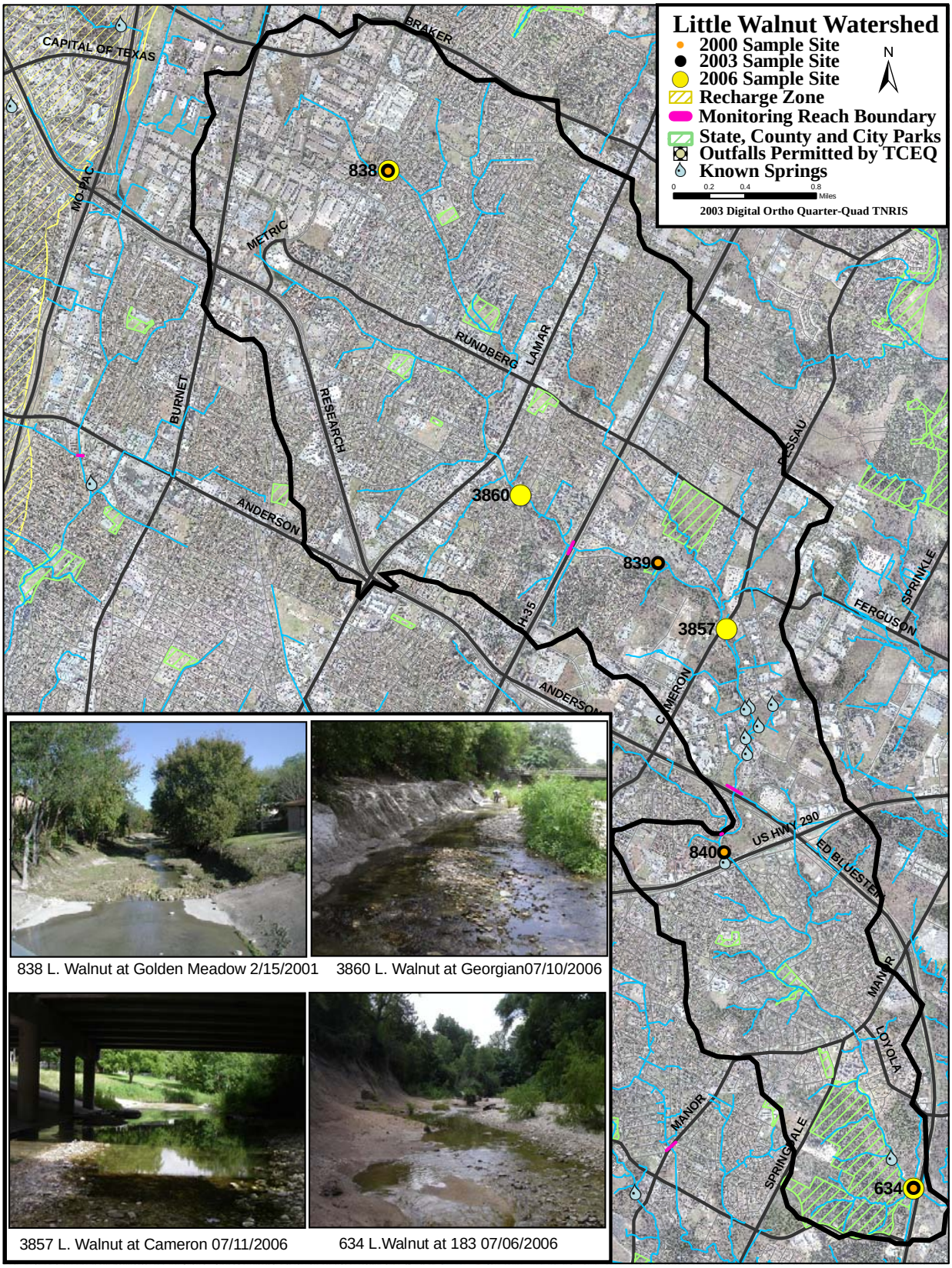
Little Walnut Creek Watershed

Land Use Map



Little Walnut Creek Watershed

Aerial Map



838 L. Walnut at Golden Meadow 2/15/2001

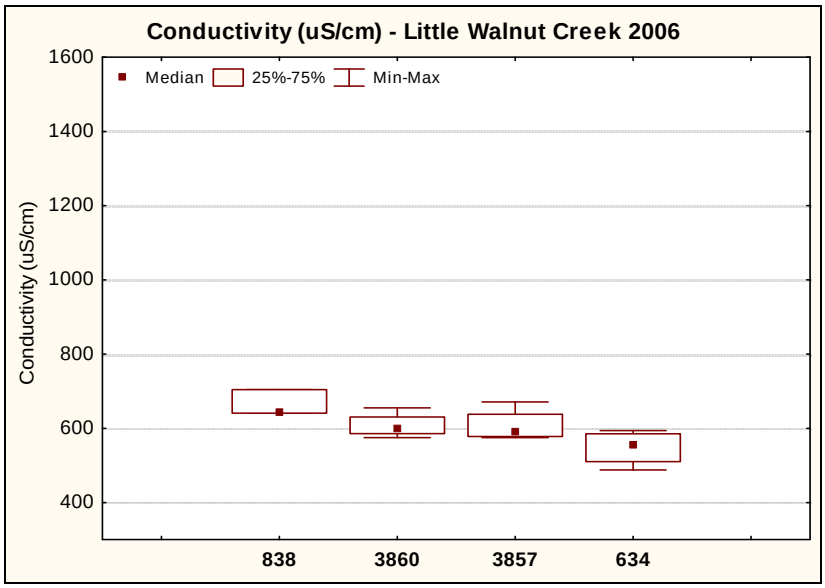
3860 L. Walnut at Georgian07/10/2006

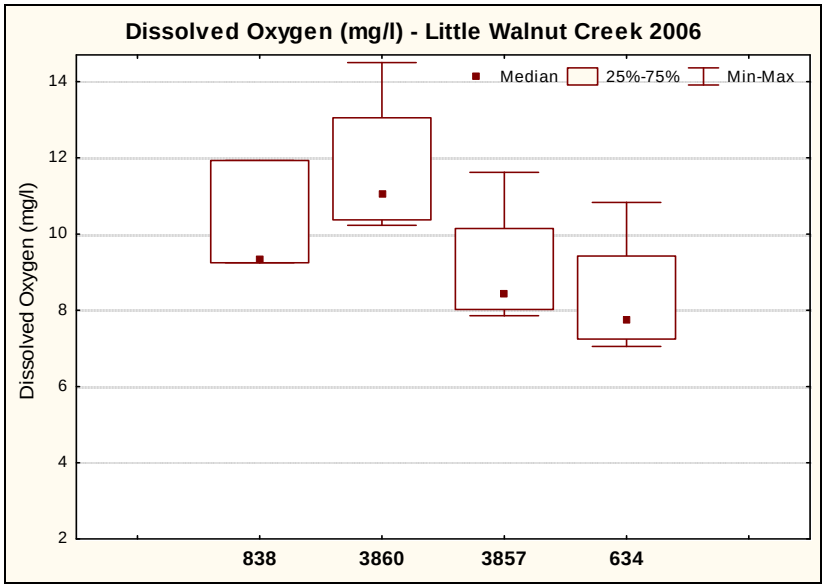
3857 L. Walnut at Cameron 07/11/2006

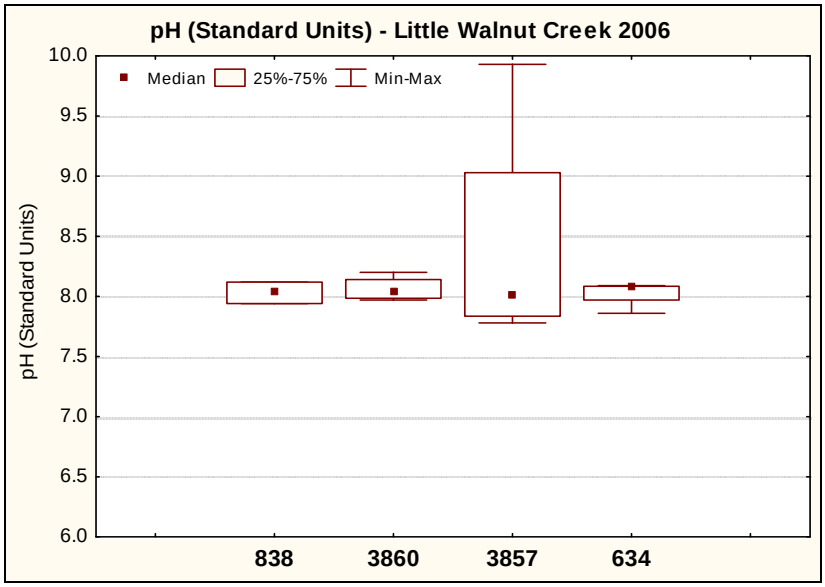
634 L.Walnut at 183 07/06/2006

Little Walnut Creek Watershed

Data Summary Graphs – Field Parameters

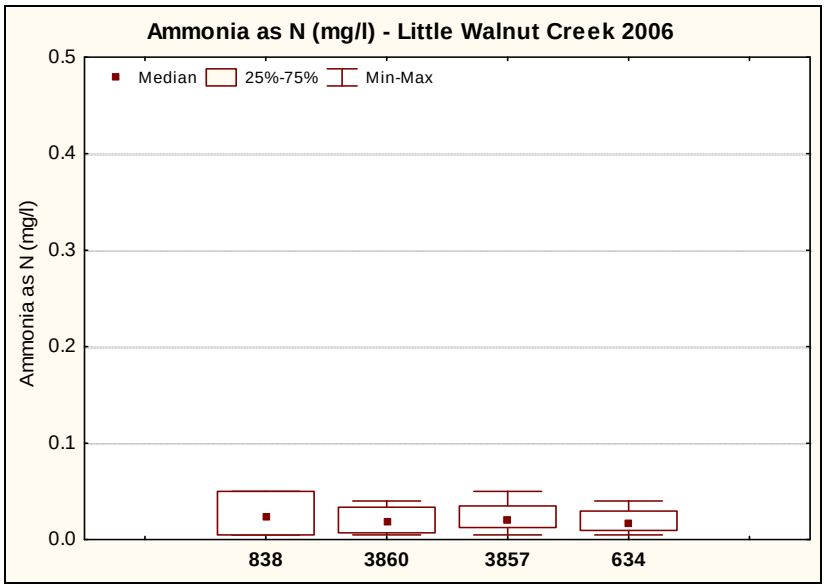


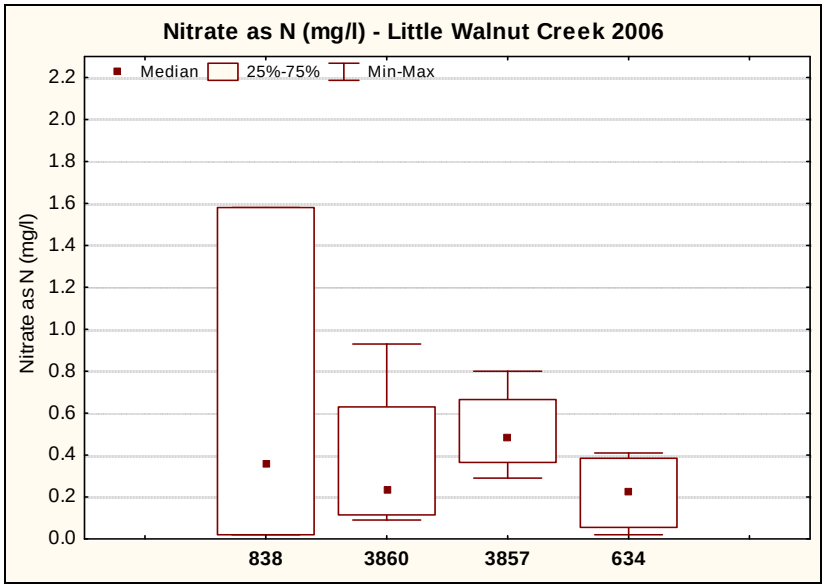


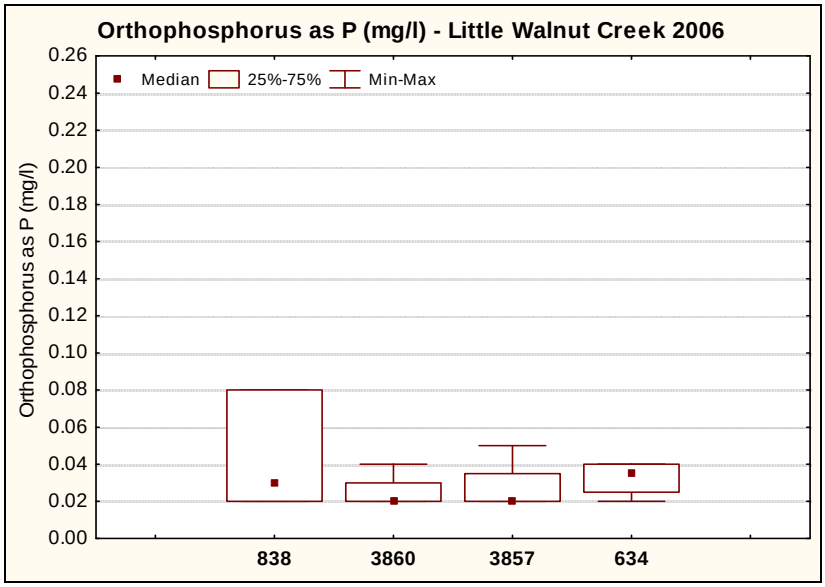


Little Walnut Creek Watershed

Data Summary Graphs – Nutrients

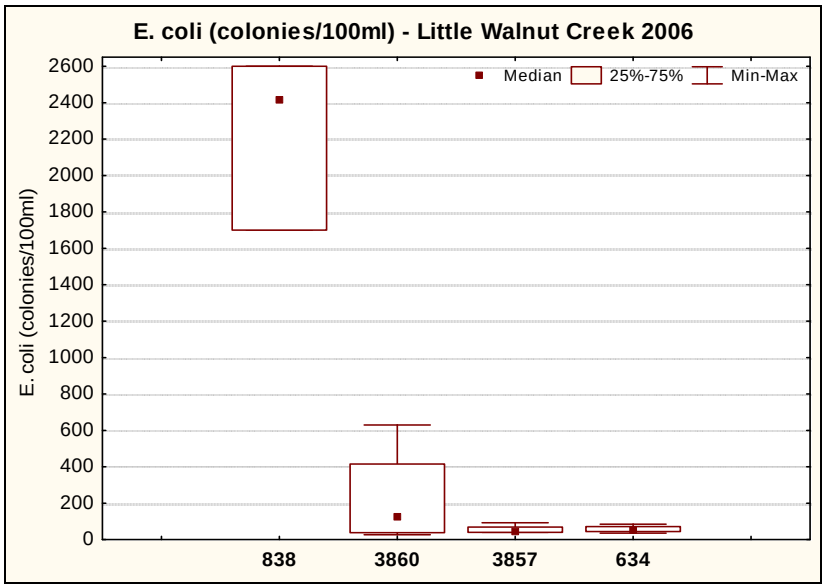


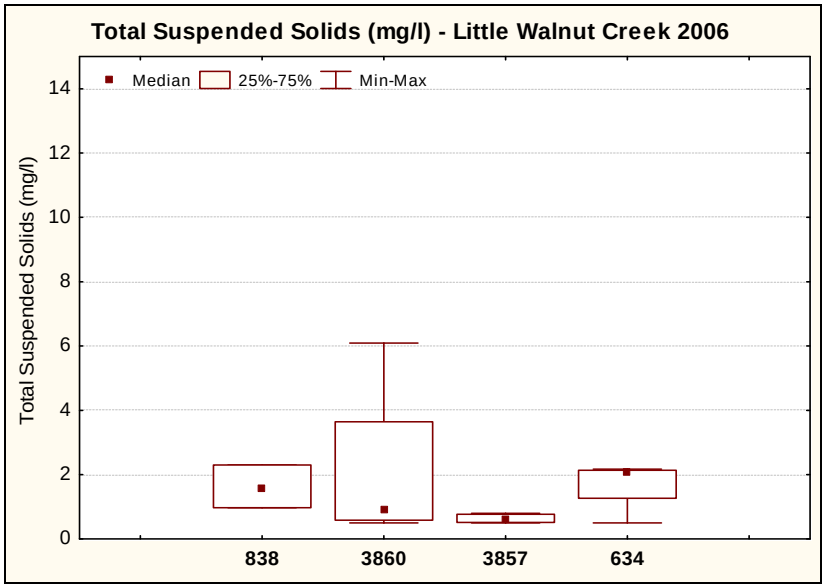


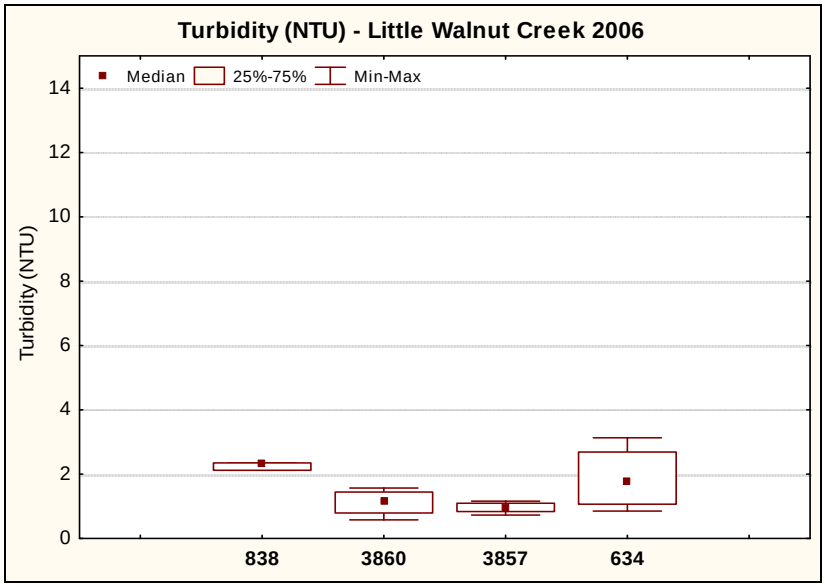


Little Walnut Creek Watershed

Data Summary Graphs – Physical Parameters



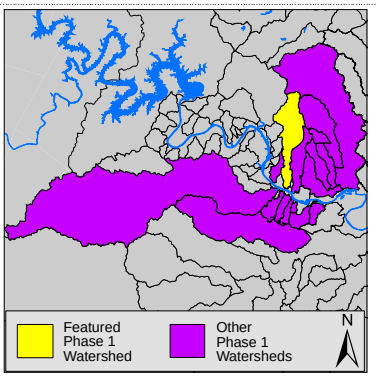




Shoal Creek Watershed

Summary Sheet

Catchment	Total area	13 square miles	
	Area in recharge	3 square miles	
	Creek length	11 miles	
	Receiving water	Town Lake	
Demographics	2000 population	59,011	
	2030 projected population	78,759	
	30 year projected % increase	33 %	
Land Use	Impervious cover ('97 crwr data)	47.2 %	
Overall EII Scores	2000	60	
	2003	54	
	2006	55	



Flow Regime* for Sample Sites on Shoal Creek Upstream to Downstream

Site #	Site Name	2003 Feb 19 WQ	2003 Mar 10-17 Bio	2003 May 14 WQ	2003 Sep 23 WQ	2003 Dec 3 WQ	2006 Feb 22 WQ	2006 May 18 WQ	2006 Jul 5-12 Bio	2006 Aug 23 WQ	2006 Nov 29 WQ
118	Shoal downstream of Cross Creek	B	B	B	B	n	B	B	B	n	B
117	Shoal at Shoal Edge Court	B	B	B	B	B	B	B	B	n	B
116	Shoal at 24th St	B	B	B	B	B	B	B	B	n	B
122	Shoal above 1st Street	B	B	B	B	B	B	B	B	B	B

* B = baseflow conditions n = no flow was present Storm = storm flow was present
Blue = Samples were taken Grey = Samples were not taken Blank = site not visited

	Parameter	Mean	Max	Min	Relative concentrations compared to other 2006 Phase 1 watersheds
Physicochemical	**D.O.** mg/l	7.4	10.8	3.2	Most sites were average, however Site 118 showed a wide range of values
	pH st.units	7.75	8.02	7.07	Mostly average[1], with two low concentrations at Sites 122 and 118 in Nov
	Cond uS/cm	704	915	448	Above average or high at Sites 116 and 122, below average at upstream sites
	SO_4 mg/l	68.9	137.0	25.5	High at Site 116, above average at Site 122, average[1] at other sites
Nutrients	**NH_3** mg/l	0.04	0.20	0.01	Consistently high at Site 122, average[1] at other sites
	NO_3 mg/l	0.61	2.14	0.02	Consistently high at Site 122, average[1] at other sites, typically higher in May
	Ortho P mg/l	0.12	0.43	0.02	Consistently high at Site 122, average[1] at other sites
Sediment Load	**TSS** mg/l	2.5	9.2	0.5	High values in August for Site 122, otherwise most sites typically average[1] with occasional above average concentrations
	Turbidity ntu	2.3	7.8	0.9	
Biology	**E.Coli** /100ml	1,190	4,839	6	Sites 116 and 122 chronically high, upstream sites 118 and 117 average[1]
	Benthic Macs	Below average scores at Site 122, but average scores for the upstream sites			
	Diatoms	Below average or average[1] scores for all parameters. Consistently low *Cymbella* richness.			

[1] values for this parameter are similar to the median scores for the other 2006 Phase 1 watersheds

Discussion: There was a downstream decreasing trend in water quality in 2000, 2003 and 2006. While the upstream site (Site 118) maintains "fair" or "good" scores for most parameters, the mouth site (Site 122) consistently has "poor" to "marginal" scores for most parameters. Poor scores at site 122 are due to high nutrients, high bacteria and high conductivity concentrations and low integrity of aquatic life. Site 116 and Site 122 had very low contact recreation scores due to chronically high bacteria levels.

Sub-index scores for Shoal Creek Sites (upstream to downstream) 2000, 2003, 2006

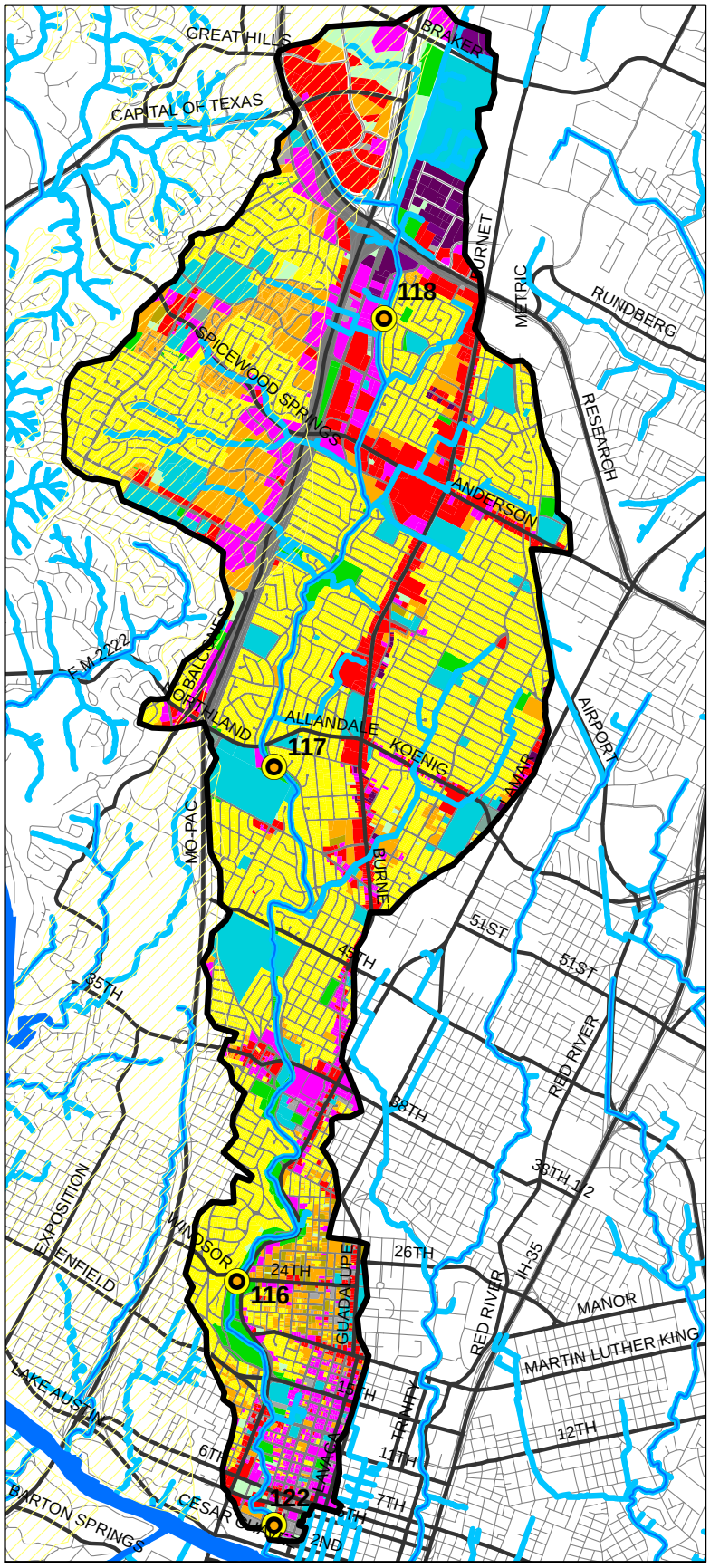
Site Number	Site 118			Site 117			Site 116			Site 122		
Year of Sampling	2000	2003	2006	2000	2003	2006	2000	2003	2006	2000	2003	2006
Water Quality	64	68	70	62	62	67	53	51	48	44	32	34
Sediment	89	68	59	89	68	59	89	68	59	89	68	59
Contact Recreation	75	67	59	65	62	49	74	41	24	63	60	30
Non-Contact Rec.	63	68	53	77	65	72	63	66	79	64	34	59
Physical Integrity	42	54	58	45	65	57	26	32	47	33	35	46
Aquatic Life	62	37	56	39	36	59	38	36	64	37	45	38
Benthic Mac.	60	41	53	40	32	58	40	29	62	31	34	30
Diatom	64	32	59	37	40	60	36	43	66	42	56	45
Total EII Score	66	60	59	63	60	61	57	49	54	55	46	44

* sediment samples only collected at the downstream site, blank cells indicate parameter was not collected, blank columns indicate site was dropped

100-87.5 Excellent 87.5-75 V. Good 75-62.5 Good 62.5-50 Fair 50-37.5 Marginal 37.5-25 Poor 25-12.5 Bad 12.5-0 V. Bad

Shoal Creek Watershed

Land Use Map



Shoal Creek Watershed

- 2000 Sample Site
- 2003 Sample Site
- 2006 Sample Site
- Recharge Zone
- Major Roads
- Creeks
- Single-Family
- Large Lot Single-Family
- Multi-family
- Commercial
- Office
- Industrial
- Mining / Landfill
- Civic
- Golf Course / Agricultural
- Open / Parks / Undeveloped
- Wildlife Preserve
- Transportation / Utilities

0 0.250.5 1 Miles

N

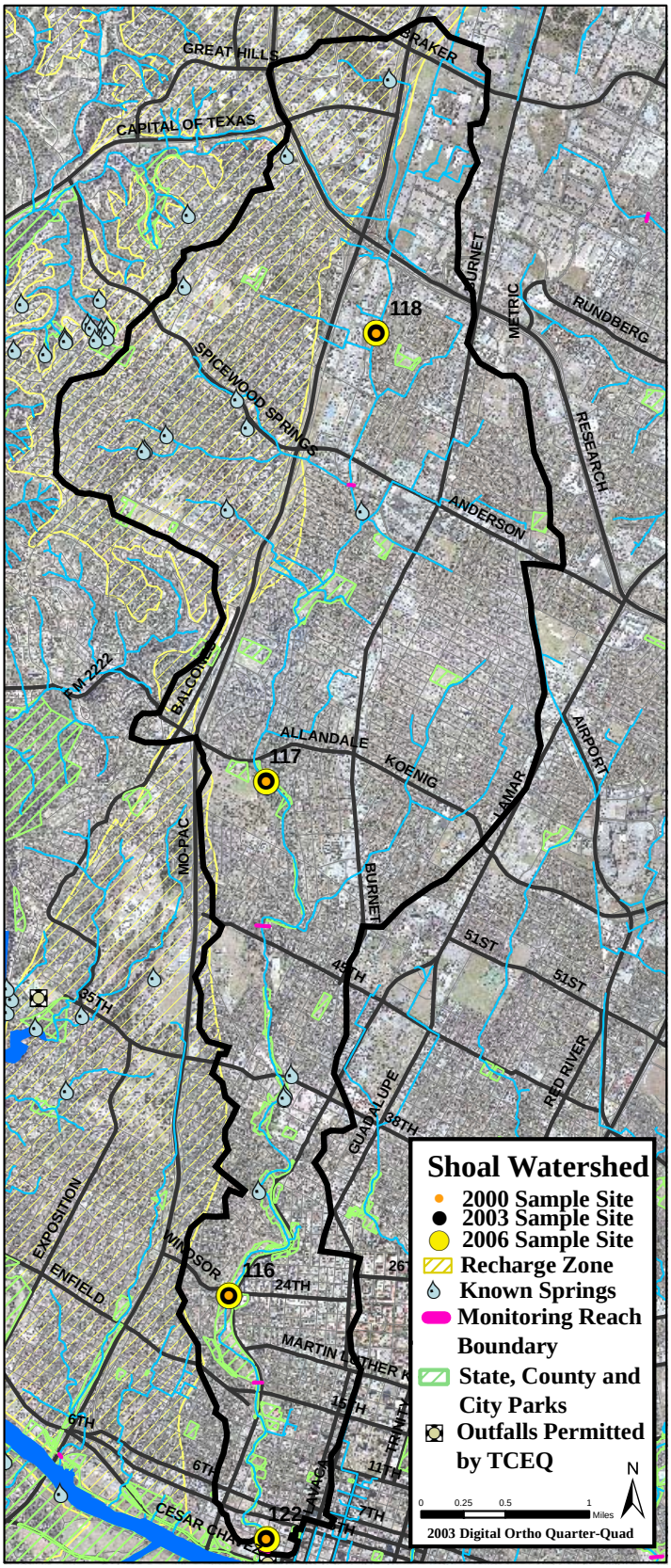
Landuse Coverage Based on 2003 Data

Land Use and Development:

The Shoal Creek watershed is fourth largest Phase 1 watershed and has the fourth highest percentage of impervious cover of all of Austin's watersheds. Much of the creek has been channelized and stabilized through numerous projects as the watershed became more urbanized. Projects designed to improve water quality, reduce flooding and stabilize banks continue such as the Austin Clean Water Program and the Shoal Creek Greenbelt Stream Restoration.

Shoal Creek Watershed

Aerial Map



118 Shoal d/s of CrossCreek 07/07/2006

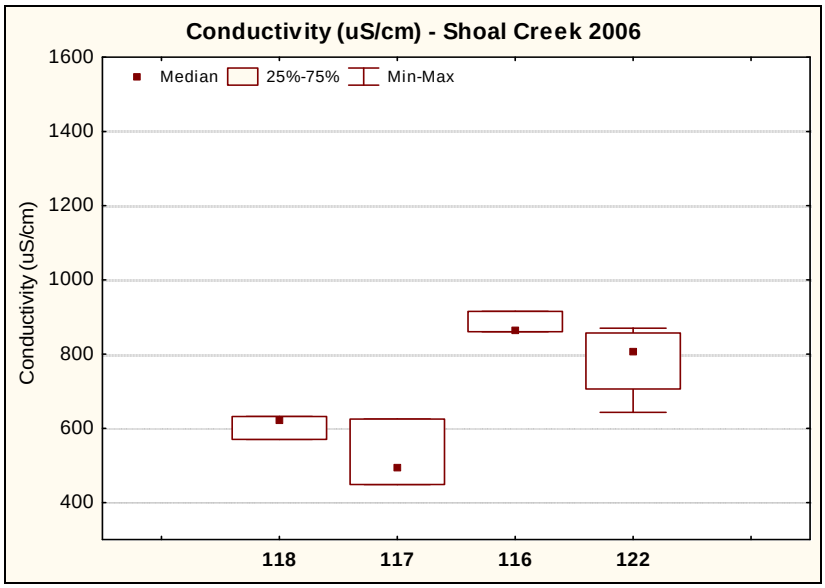
117 Shoal at Shoal Edge Court 07/07/2006

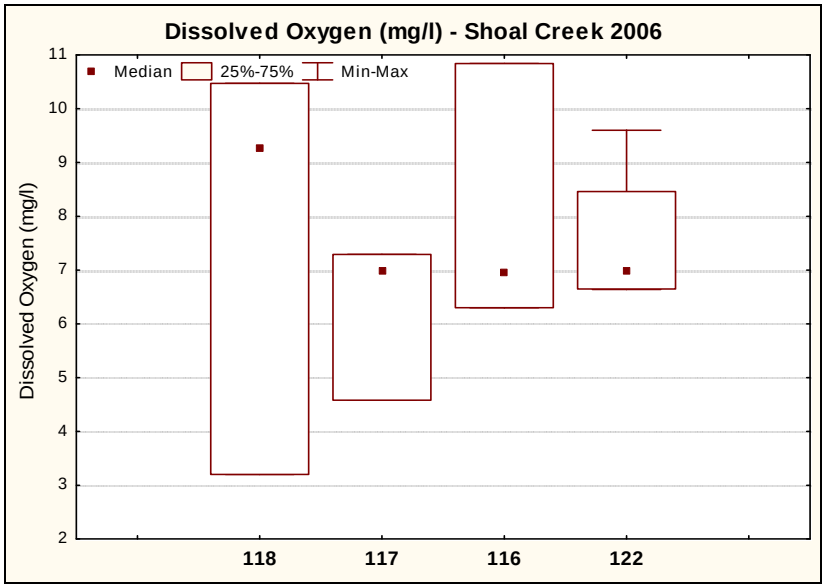
116 Shoal at 24th St 02/12/2001

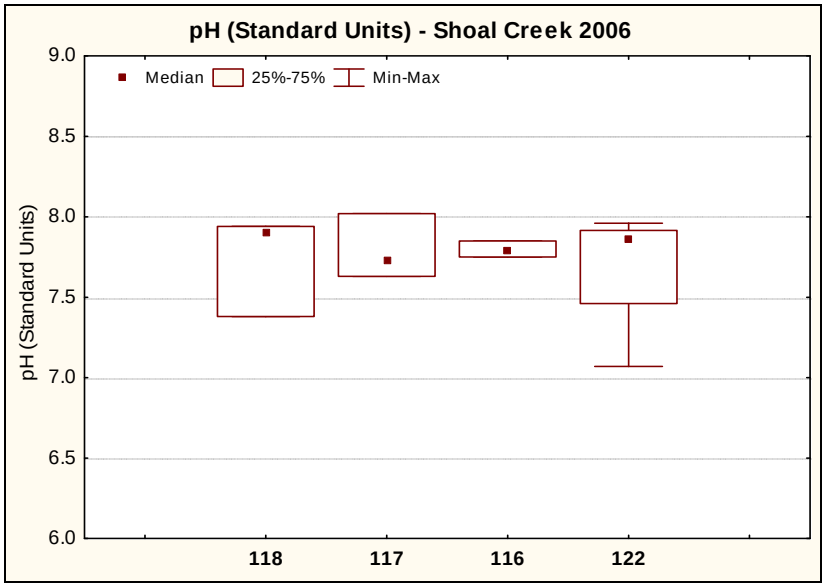
122 Shoal Above 1st Street 07/05/2006

Shoal Creek Watershed

Data Summary Graphs – Field Parameters

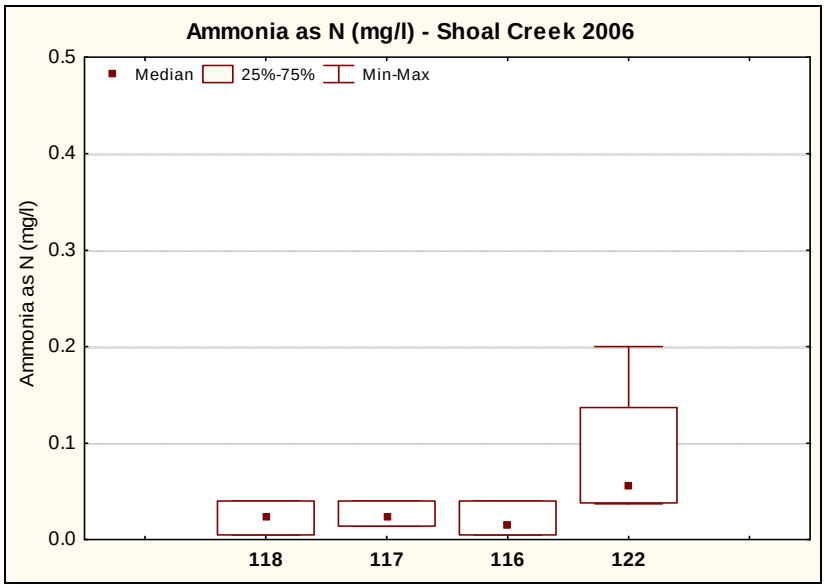


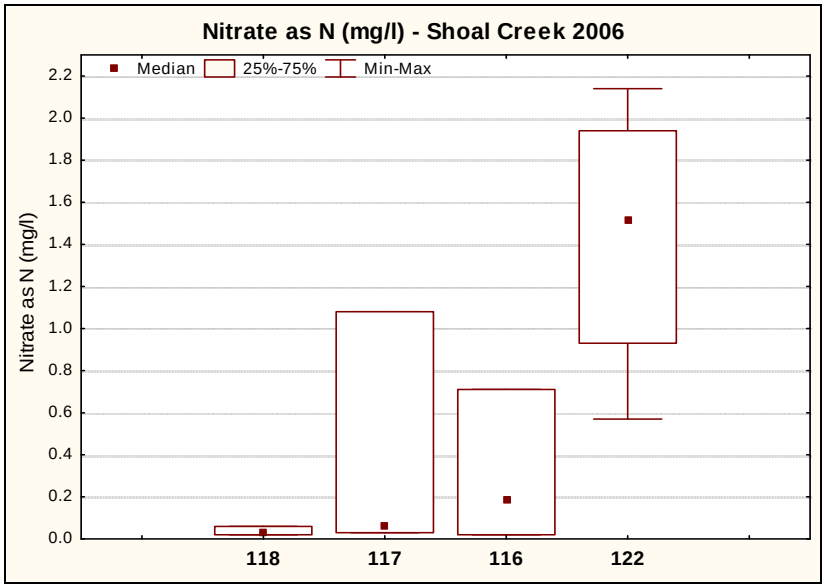


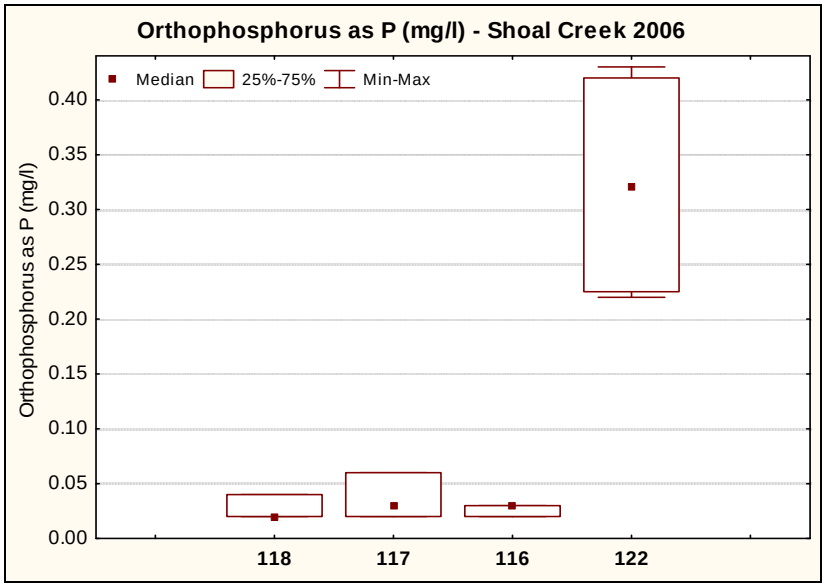


Shoal Creek Watershed

Data Summary Graphs – Nutrients

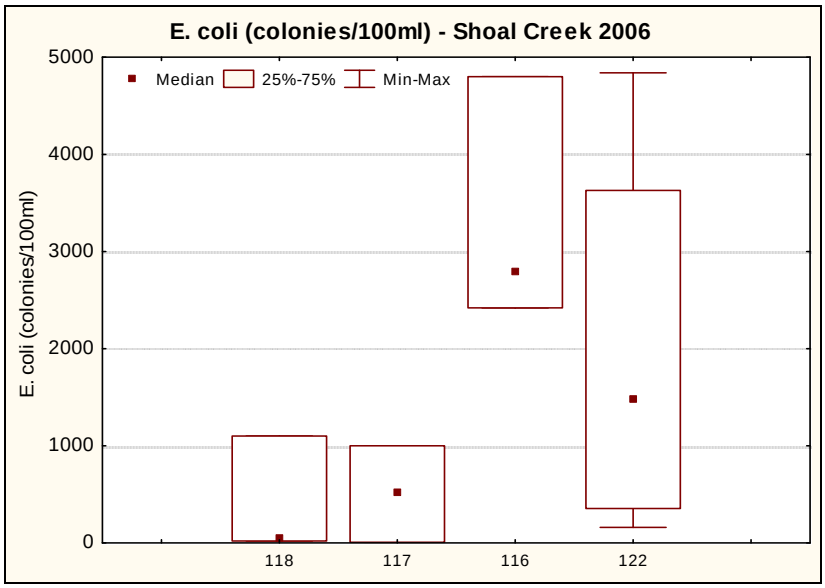


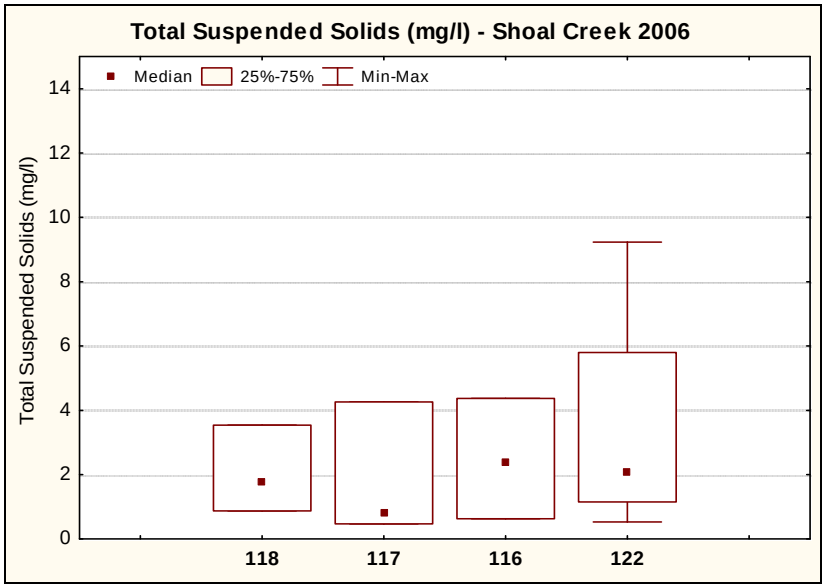


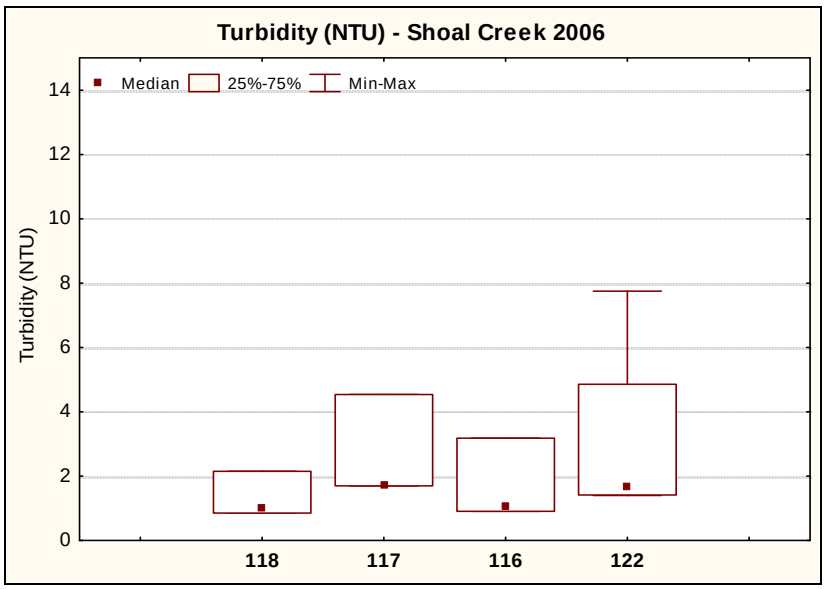


Shoal Creek Watershed

Data Summary Graphs – Physical Parameters



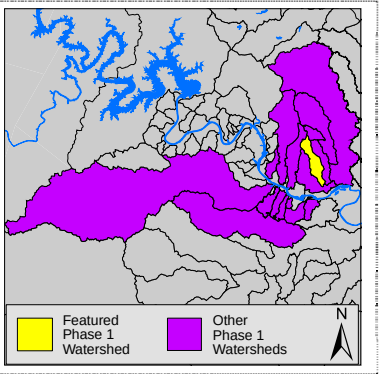




Tannehill Creek Watershed

Summary Sheet

Catchment	Total area	4 square miles	
	Area in recharge	none	
	Creek length	7 miles	
	Receiving water	Boggy Creek	
Demographics	2000 population	13,976	
	2030 projected population	24,742	
	30 year projected % increase	77 %	
Land Use	Impervious cover ('97 crwr data)	43.5 %	
Overall EII Scores	2000	61	
	2003	62	
	2006	62	



Flow Regime* for Sample Sites on Tannehill Creek Upstream to Downstream

Site #	Site Name	2003 Feb 19 WQ	2003 Mar 10-17 Bio	2003 May 14 WQ	2003 Sep 23 WQ	2003 Dec 3 WQ	2006 Feb 22 WQ	2006 May 18 WQ	2006 Jul 5-12 Bio	2006 Aug 23 WQ	2006 Nov 29 WQ
3858	Tannehill at Berkman						B	B	B	n	B
842	Tannehill at Bartholomew Park	B	B	B	B	B					
843	Tannehill at Lovell	B	B	B	B	B	B	B	B	n	B
1476	Tannehill at Desirable Drive	B	B	B	B	B	n	n	B	n	B

* B = baseflow conditions n = no flow was present Storm = storm flow was present
Blue = Samples were taken Grey = Samples were not taken Blank = site not visited

	Parameter	Mean	Max	Min	Relative concentrations compared to other 2006 Phase 1 watersheds
Physicochemical	**D.O.** mg/l	8.4	10.4	5.9	Average[1]
	pH st.units	7.93	8.55	7.15	Above average at Site 3858, low at Site 1476
	Cond uS/cm	566	672	462	Most values were below average
	SO_4 mg/l	51.6	61.9	41.8	Average[1]
Nutrients	**NH_3** mg/l	0.03	0.05	0.01	Average[1]
	NO_3 mg/l	0.08	0.22	0.02	Average[1]
	Ortho P mg/l	0.03	0.07	0.02	Average[1]
Sediment Load	**TSS** mg/l	2.1	6.8	0.8	Site 843 with a single high concentration in Nov. Average[1] at all other sites
	Turbidity ntu	2.2	4.9	1.3	Site 843 with a single high concentration in Nov. Average[1] at all other sites
Biology	**E.Coli** /100ml	161	400	4	Average[1]
	Benthic Macs	Site 1476 only had 66 individuals in the sample and the lowest scores of 2006. Site 3858 average, Site 843 above avg			
	Diatoms	Site 3858 and 1476 were below average or low for all parameters, while Site 843 was average[1]			

[1] values for this parameter are similar to the median scores for the other 2006 Phase 1 watersheds

Discussion: Despite the low aquatic life scores at Site 1476, Tannehill Creek typically has better sub-index scores than the surrounding watersheds of comparable size. Bacteria concentrations are lower than most of the other urban sites and water quality parameters are typically good. Nutrient concentrations were generally low or average compared to the other Phase I watersheds during 2006. Bacteria concentrations appear to show a downstream decreasing trend.

Sub-index scores for Tannehill Creek Sites (upstream to downstream) 2000, 2003, 2006

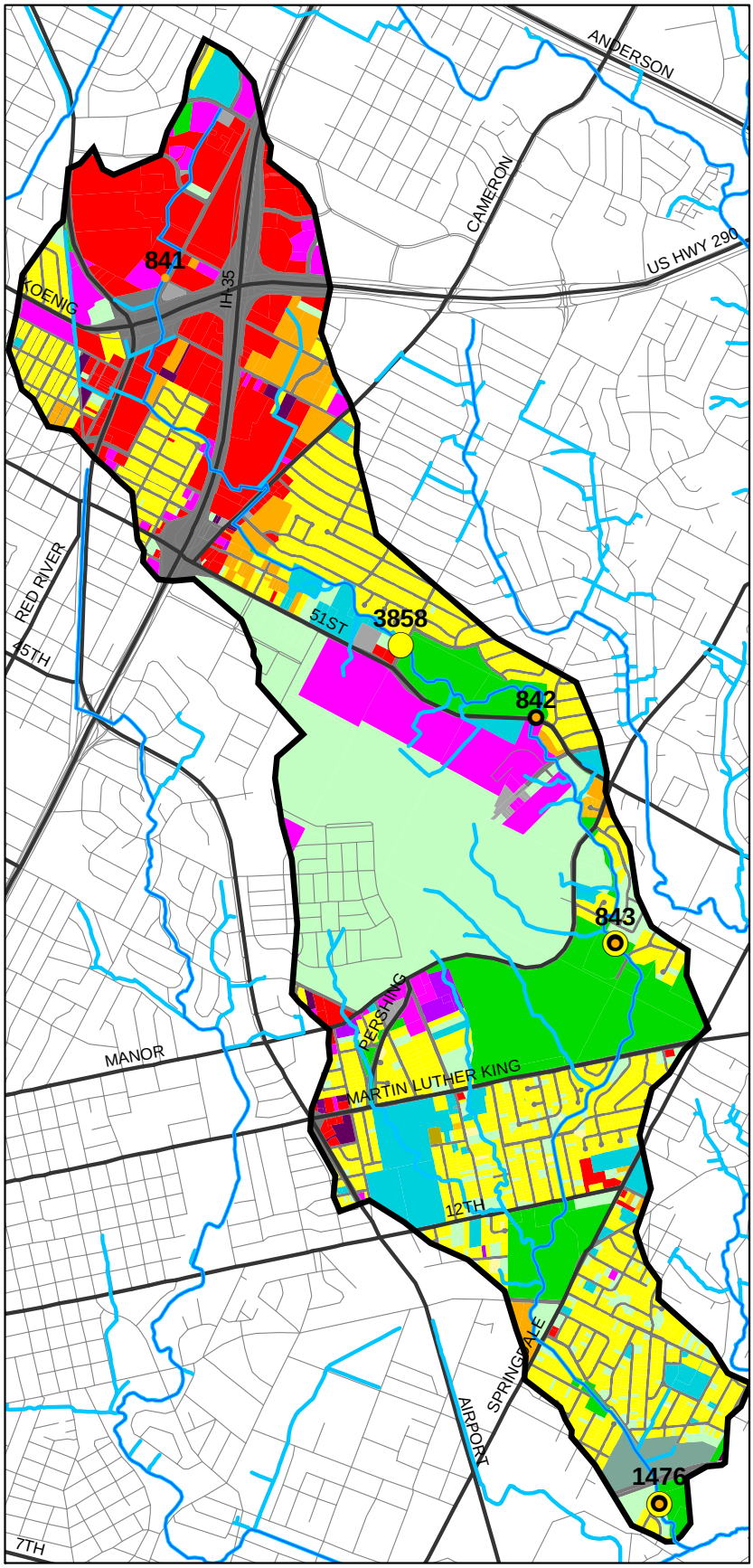
Site Number	Site 3858			Site 842			Site 843			Site 1476		
Year of Sampling	2000	2003	2006	2000	2003	2006	2000	2003	2006	2000	2003	2006
Water Quality			70	71	68		69	64	67	66	64	62
Sediment			69	89	75		89	75	69	89	75	69
Contact Recreation			38	86	80		90	73	57	91	75	98
Non-Contact Rec.			66	65	74		76	68	85	74	53	53
Physical Integrity			57	23	64		38	42	62	38	45	37
Aquatic Life			54	32	33		33	30	74	36	53	33
Benthic Mac.			46	29	23		29	22	76	35	58	11
Diatom			62	34	42		37	38	72	36	48	54
Total EII Score			59	61	66		66	59	69	66	61	59

* sediment samples only collected at the downstream site, blank cells indicate parameter was not collected, blank columns indicate site was dropped

100-87.5 Excellent 87.5-75 V. Good 75-62.5 Good 62.5-50 Fair 50-37.5 Marginal 37.5-25 Poor 25-12.5 Bad 12.5-0 V. Bad

Tannehill Creek Watershed

Land Use Map



Tannehill Watershed

- 2000 Sample Site
- 2003 Sample Site
- 2006 Sample Site
- Recharge Zone
- Major Roads
- Creeks
- Single-Family
- Large Lot Single-Family
- Multi-family
- Commercial
- Office
- Industrial
- Mining / Landfill
- Civic
- Golf Course / Agricultural
- Open / Parks / Undeveloped
- Wildlife Preserve
- Transportation / Utilities

0 0.25 0.5 Miles

N

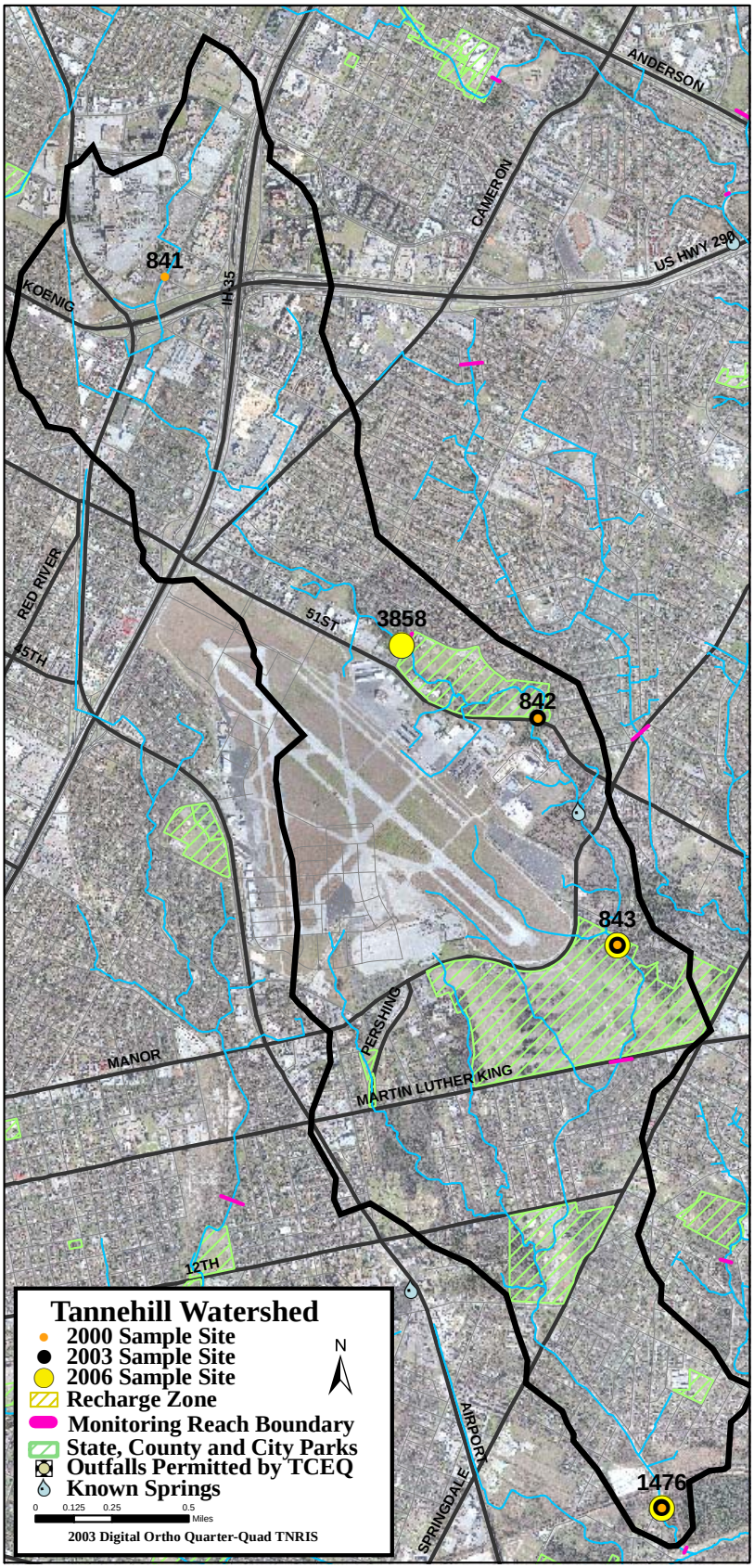
Landuse Coverage Based on 2003 Data

Land Use and Development:

Although baseflow often disappears below the alluvium during the summer months, Tannehill Creek maintains more baseflow than its neighboring watersheds. The Tannehill Creek watershed has highly unstable and eroded banks due to the loose, sandy soils. Problematic erosion issues at Bartholomew Park have been mitigated with bank stabilization and streambed modification projects. Trash and debris are a chronic problem. Well known sites in the watershed include the new development on the former Robert Mueller Airport, Morris Williams Golf Course, Bartholomew Park, and Highland Mall.

Tannehill Creek Watershed

Aerial Map



3858 Tannehill at Berkman 07/10/2006

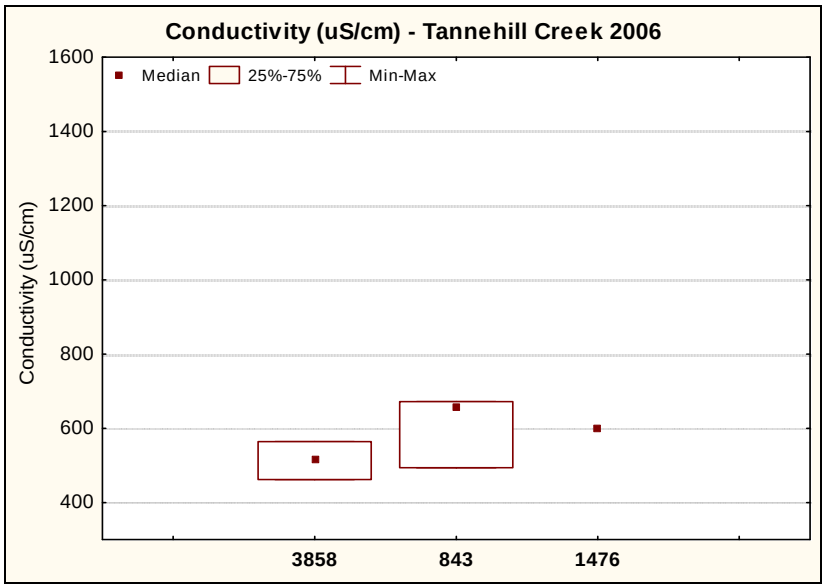
842 Tannehill at Bartholomew

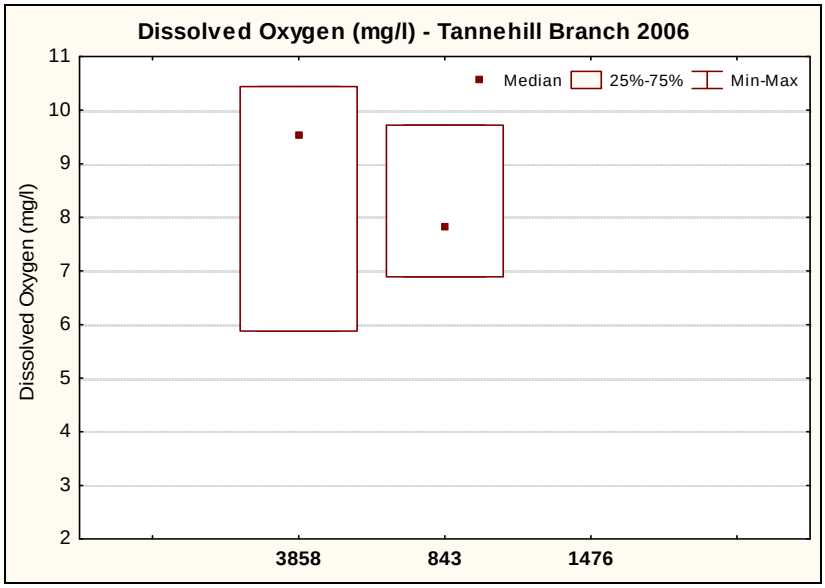
843 Tannehill at Lovell 07/10/2006

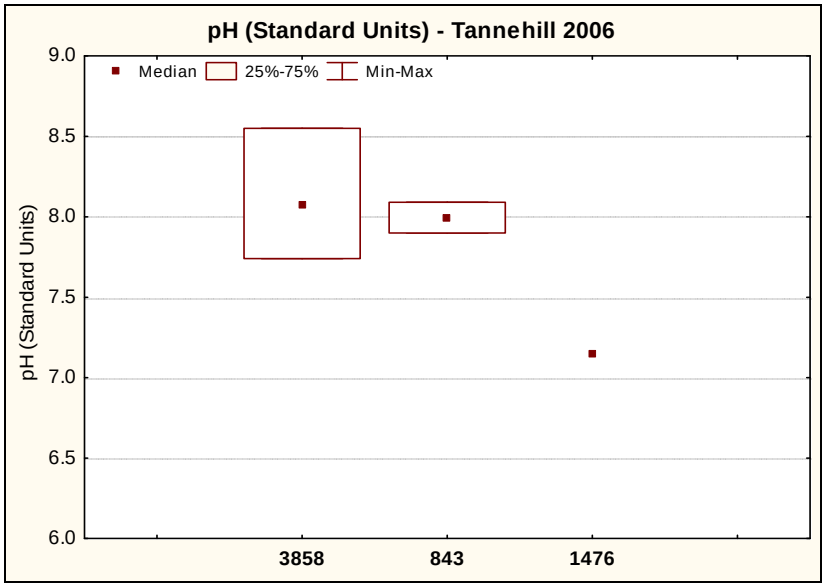
1476 Tannehill at Desirable Dr 07/06/2006

Tannehill Creek Watershed

Data Summary Graphs – Field Parameters

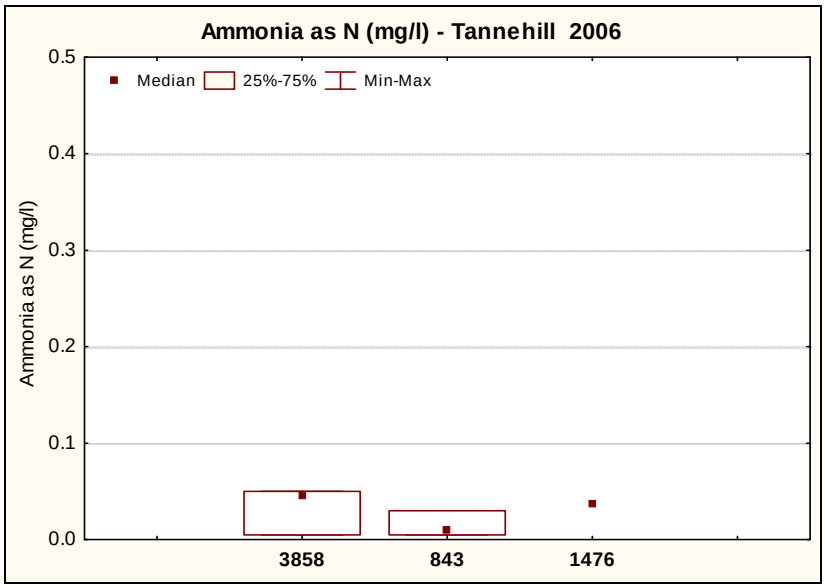


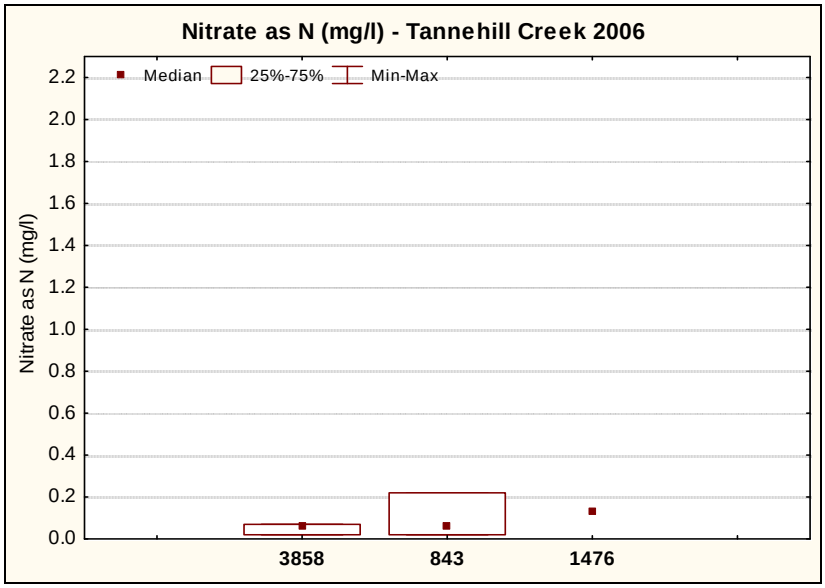


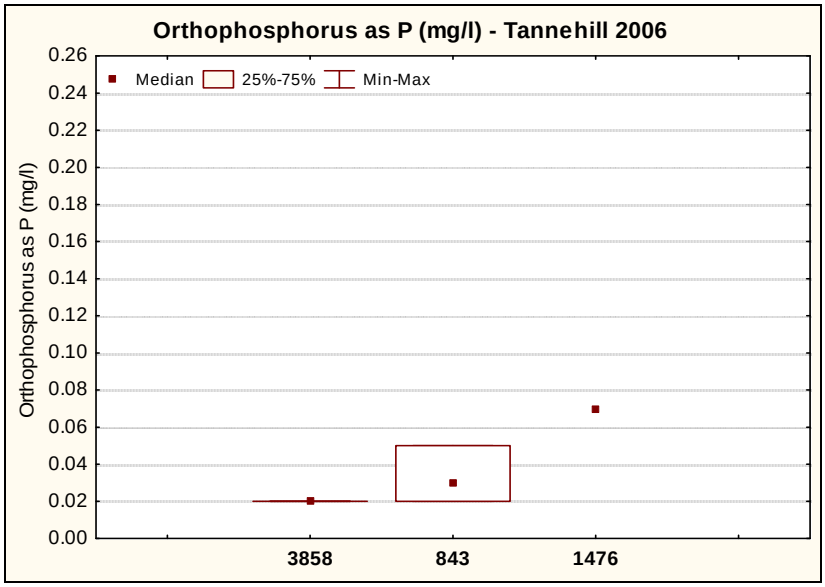


Tannehill Creek Watershed

Data Summary Graphs – Nutrients

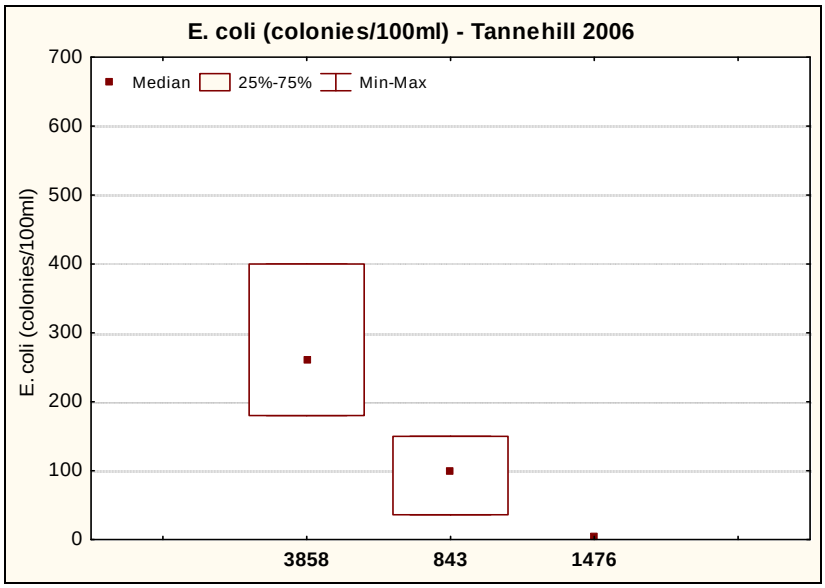


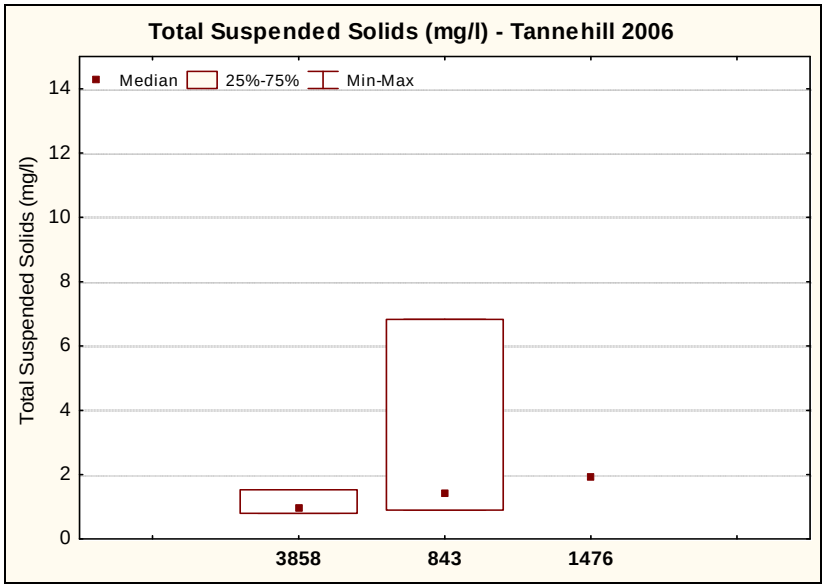


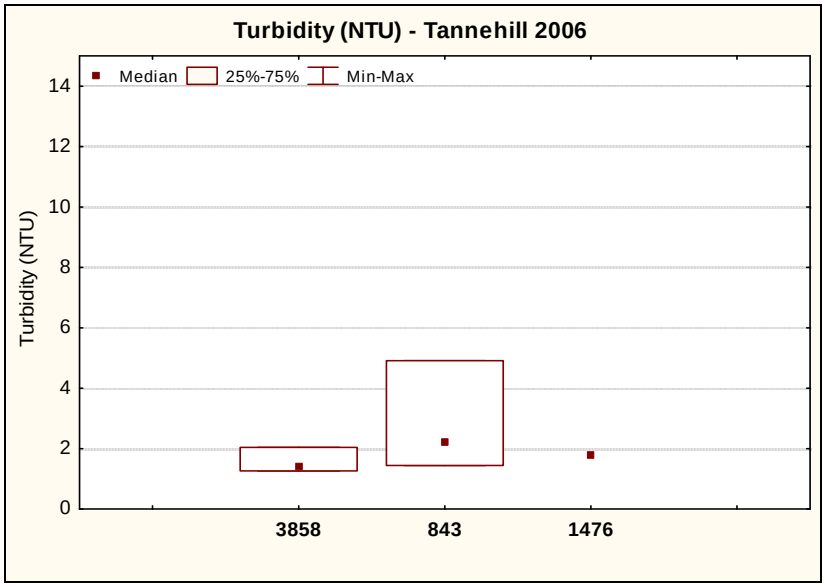


Tannehill Creek Watershed

Data Summary Graphs – Physical Parameters



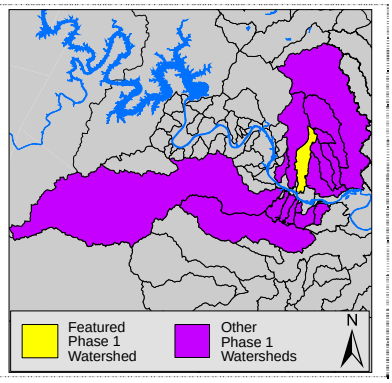




Waller Creek Watershed

Summary Sheet

Catchment	Total area	6 square miles	
	Area in recharge	none	
	Creek length	7 miles	
	Receiving water	Town Lake	
Demographics	2000 population	32,076	
	2030 projected population	42,264	
	30 year projected % increase	32 %	
Land Use	Impervious cover ('97 crwr data)	49.9 %	
Overall EII Scores	2000	54	
	2003	58	
	2006	54	



Flow Regime* for Sample Sites on Waller Creek Upstream to Downstream

		2003					2006				
		Feb	Mar	May	Sep	Dec	Feb	May	Jul	Aug	Nov
		19	10-17	14	23	3	22	18	5-12	23	29
Site #	Site Name	WQ	Bio	WQ	WQ	WQ	WQ	WQ	Bio	WQ	WQ
780	Waller at 51st Street	B	B	B	B	B	B	B	B	n	B
781	Waller at Shipe Park	B	B	B	B	B					
624	Waller upstream of 23rd Street	B	B	B	B	B	B	B	B	B	B
38	Waller Below Cesar Chavez	B	B	B	B	B	B	B	B	B	B

* B = baseflow conditions n = no flow was present Storm = storm flow was present
Blue = Samples were taken Grey = Samples were not taken Blank = site not visited

	Parameter	Mean	Max	Min	Relative concentrations compared to other 2006 Phase 1 watersheds
Physicochemical	**D.O.** mg/l	7.3	10.9	4.3	Site 38 was below average, site 624 was average, Site 780 had one low value
	pH st.units	7.89	8.35	7.28	Higher than average at site 780. Sites 624 and 38 were average[1]
	Cond uS/cm	741	908	519	Mean concentrations were slightly higher than average
	SO_4 mg/l	66.6	102.0	42.1	Above average at all sites
Nutrients	**NH_3** mg/l	0.04	0.10	0.01	Consistently above average at Site 38. Slight increasing trend downstream
	NO_3 mg/l	0.63	1.78	0.02	Consistently above average at Sites 38 and 624, average at 780
	Ortho P mg/l	0.12	0.26	0.04	Concentrations above average at Sites 624 and 38. Increasing trend downstream
Sediment Load	**TSS** mg/l	7.1	53.3	0.5	A very high concentration at Site 624 in Feb. One high conc. at Site 780 in May
	Turbidity ntu	1.7	3.8	0.7	Each site typically average[1] with occasional above average concentrations
Biology	**E.Coli** /100ml	1362	4,000	100	Consistently high at Sites 38 and 780.
	Benthic Macs	Typically below average scores with low EPT and diversity. Site 624 only had 53 individuals in the sample.			
	Diatoms	Very low. Below average at all sites. Site 624 scored the lowest of all 2006 sites on all parameters but one.			

[1] values for this parameter are similar to the median scores for the other 2006 Phase 1 watersheds

Discussion: All three years of sampling have shown a downstream decreasing trend in water quality. The downstream site (Site 38) has chronically high bacteria and nutrient concentrations. All sites have consistently below average scores in aquatic life. Benthic macroinvertebrates and diatom communities are typically low in diversity and integrity.

Sub-index scores* for Waller Creek Sites (upstream to downstream) 2000, 2003, 2006

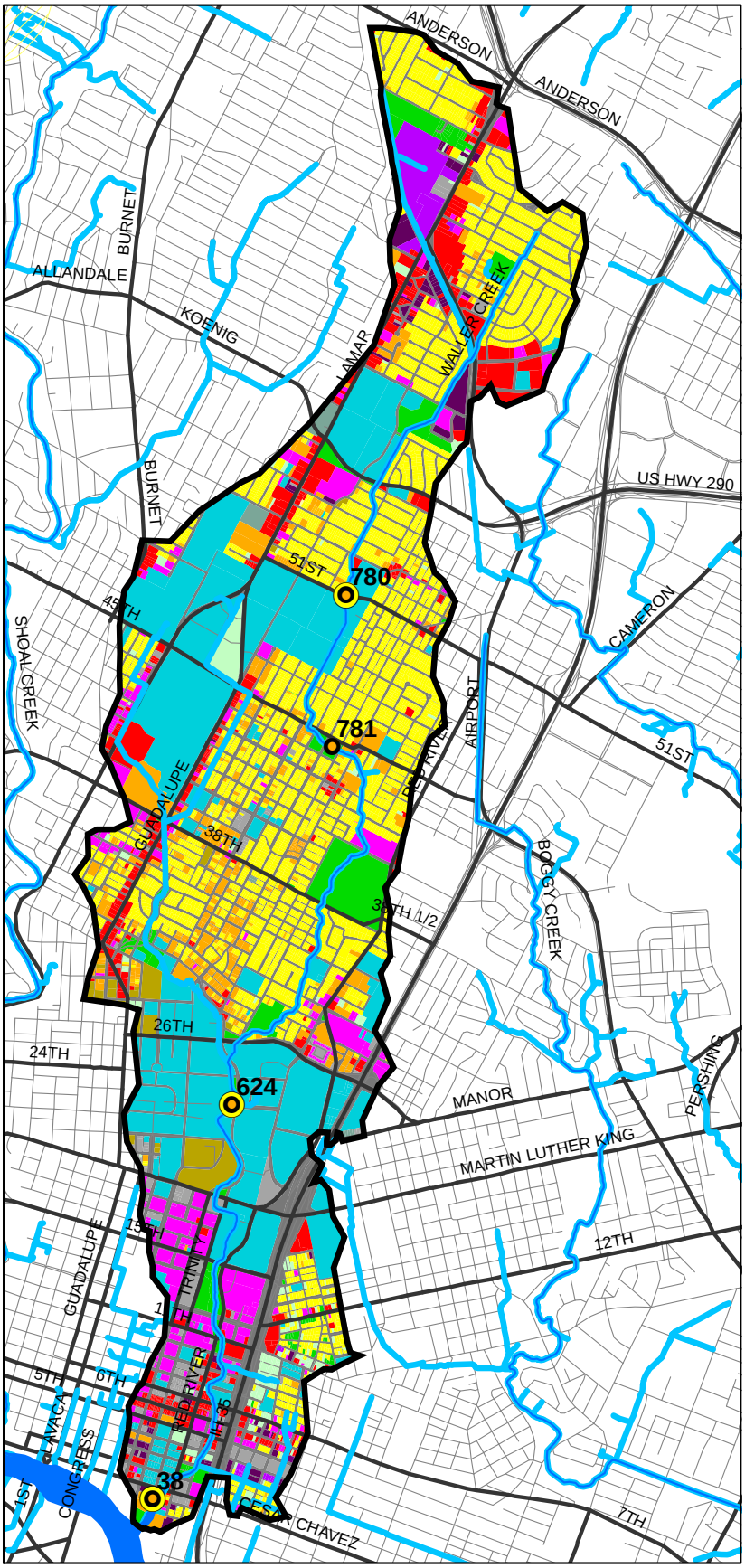
Site Number	Site 780			Site 781			Site 624			Site 38		
Year of Sampling	2000	2003	2006	2000	2003	2006	2000	2003	2006	2000	2003	2006
Water Quality	68	54	59	53	58		40	49	41	41	44	38
Sediment*	63	76	61	63	76		63	76	61	63	76	61
Contact Recreation	69	57	32	74	69		49	63	33	63	51	26
Non-Contact Rec.	71	69	90	84	80		80	82	87	59	53	68
Physical Integrity	45	63	64	39	60		49	63	68	27	43	48
Aquatic Life	29	30	44	26	36		35	37	37	28	24	45
Benthic Mac.	38	39	49	20	34		31	45	45	22	34	30
Diatom	20	21	39	31	37		38	29	28	34	14	59
Total EII Score	58	58	58	57	63		53	62	55	47	49	48

* sediment samples are only collected at the mouth site, site 781 was not sampled in 2006

100-87.5 Excellent 87.5-75 V. Good 75-62.5 Good 62.5-50 Fair 50-37.5 Marginal 37.5-25 Poor 25-12.5 Bad 12.5-0 V. Bad

Waller Creek Watershed

Land Use Map



Waller Watershed

- 2000 Sample Site
- 2003 Sample Site
- 2006 Sample Site
- Recharge Zone
- Major Roads
- Creeks

- Single-Family
- Large Lot Single-Family
- Multi-family
- Commercial
- Office
- Industrial
- Mining / Landfill
- Civic
- Golf Course / Agricultural
- Open / Parks / Undeveloped
- Wildlife Preserve
- Transportation / Utilities

0 0.25 0.5 1 Miles

N

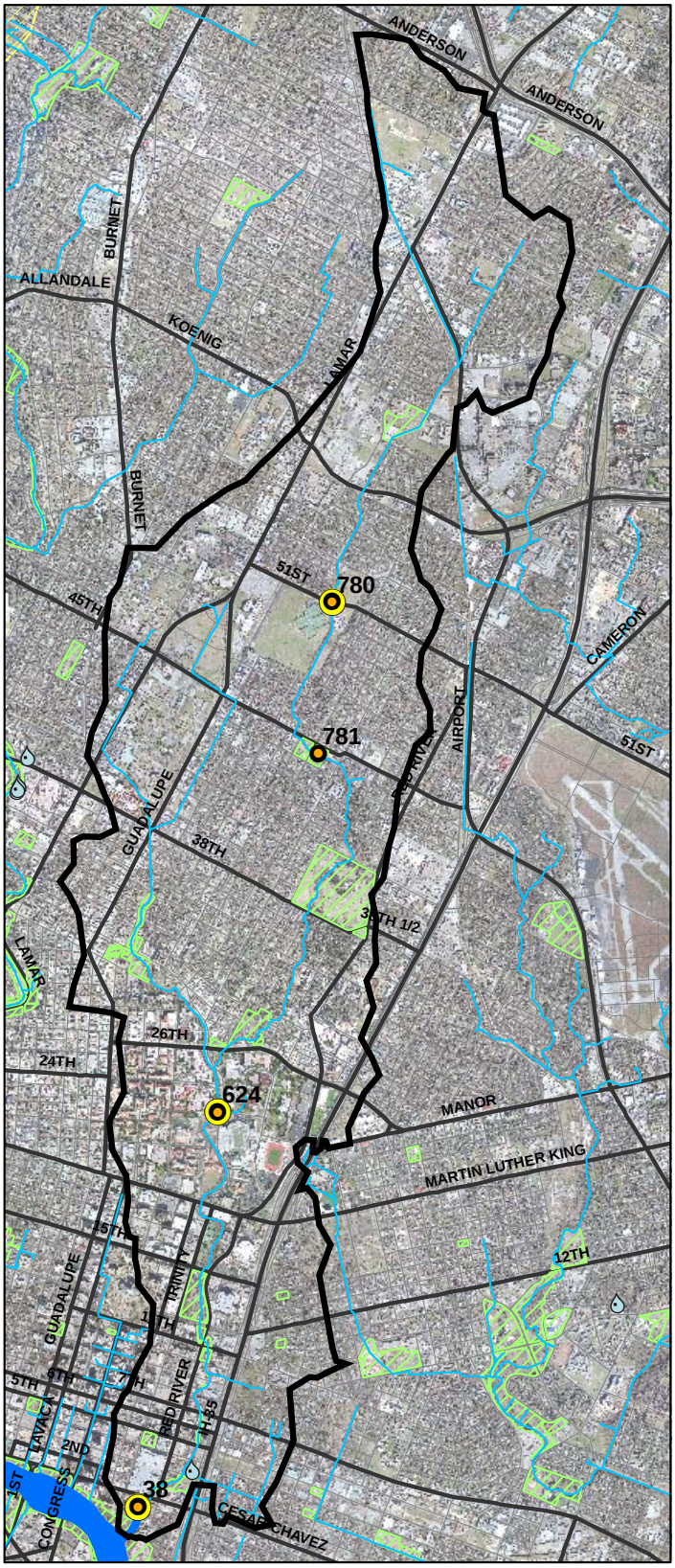
Landuse Coverage Based on 2003 Data

Land Use and Development:

The Waller Creek watershed is second only to Harper's Branch for the highest percentage of impervious cover of all the Austin watersheds. Perennial flow is maintained due to several springs and seeps along the length of the creek. Well known sites in the watershed include the University of Texas, the State Capital, the Austin Convention Center, St. David's Medical Center, Seton Heart Center and Waterloo Park. Widespread pollutant load problems in Waller Creek most likely stem from aging infrastructure and historical development with occurred prior to protective regulations.

Waller Creek Watershed

Aerial Map



780 Waller at 51st Street 02/21/2001

624 Waller upstream of 23rd Street

38 Waller Below Cesar Chavez 07/05/2006

Waller Watershed

- 2000 Sample Site
- 2003 Sample Site
- 2006 Sample Site
- Recharge Zone
- Monitoring Reach Boundary
- State, County and City Parks
- Outfalls Permitted by TCEQ
- Known Springs

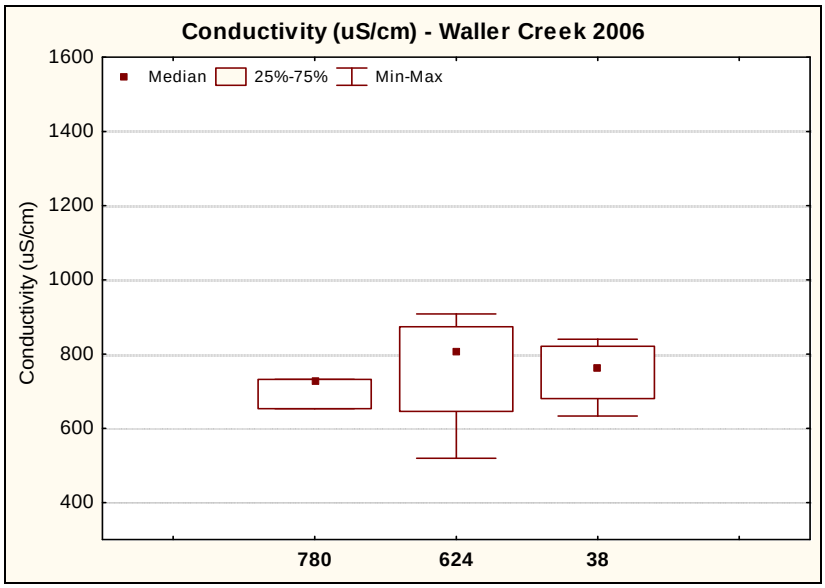
N

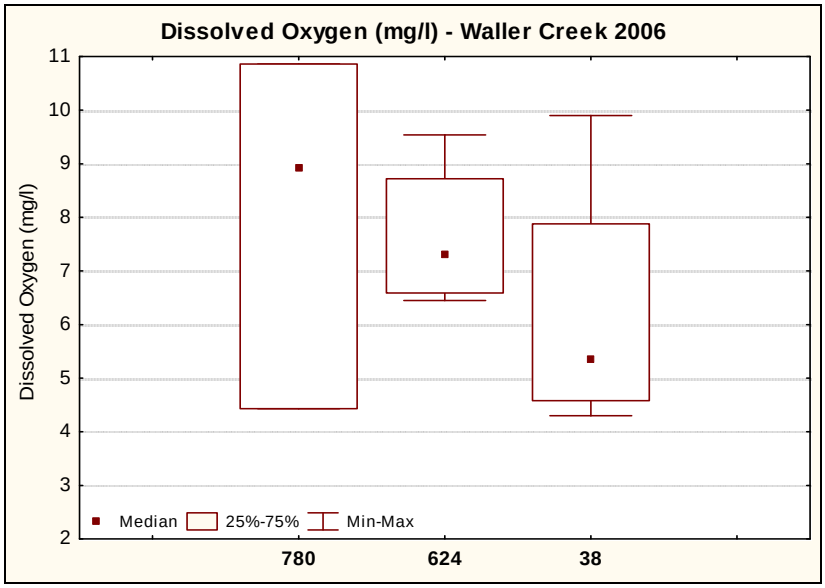
0 0.125 0.25 0.5 Miles

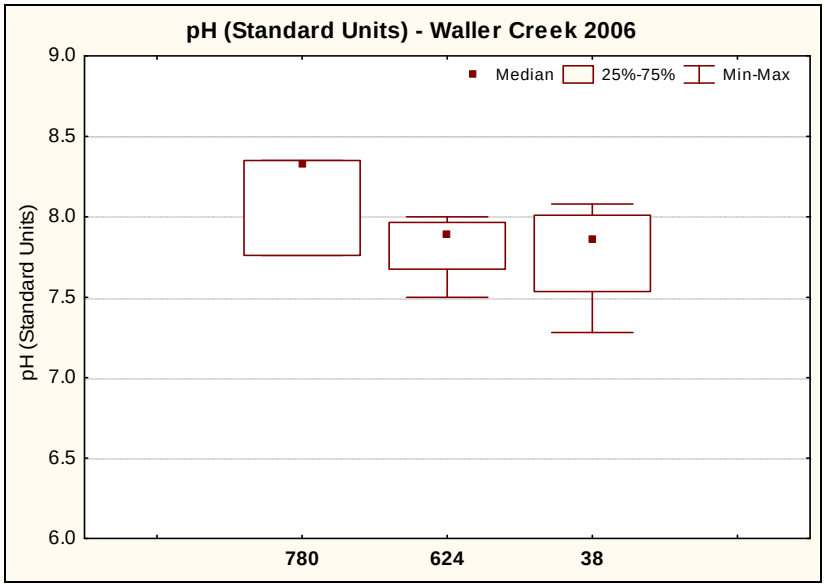
2003 Digital Ortho Quarter-Quad TNRIS

Waller Creek Watershed

Data Summary Graphs – Field Parameters

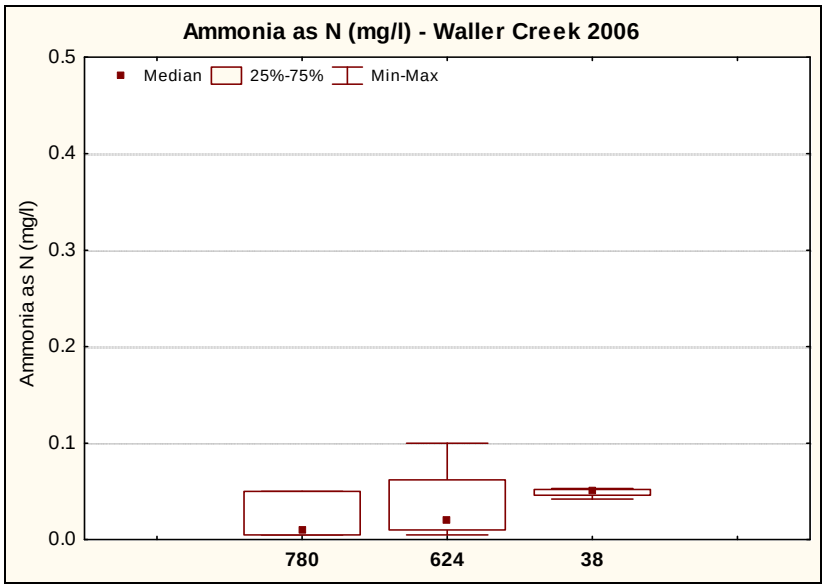


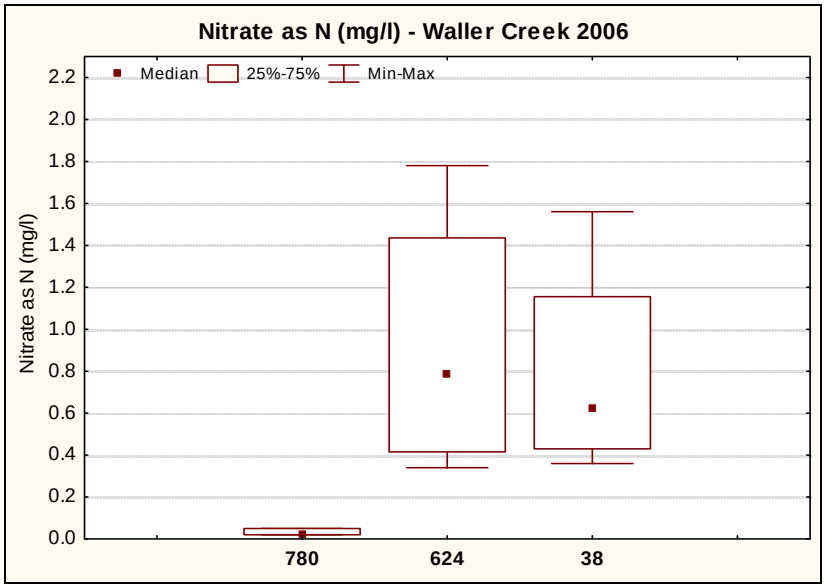


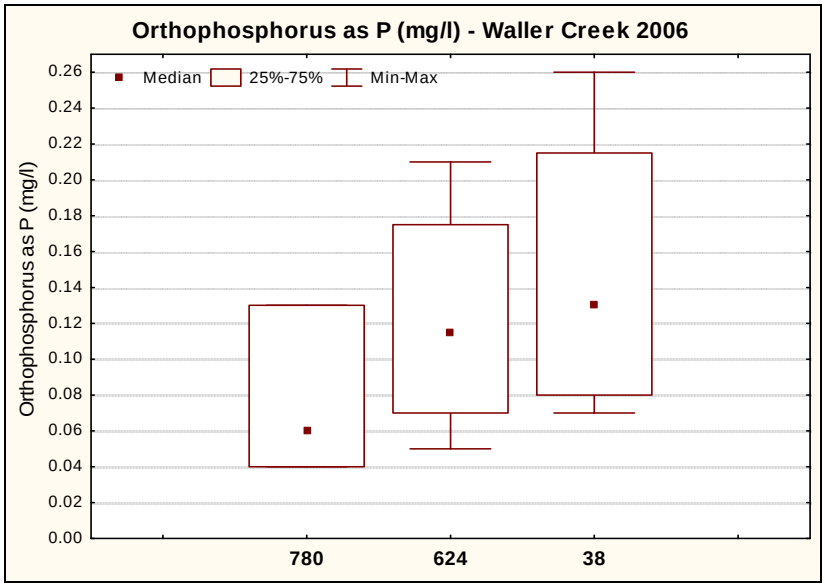


Waller Creek Watershed

Data Summary Graphs – Nutrients

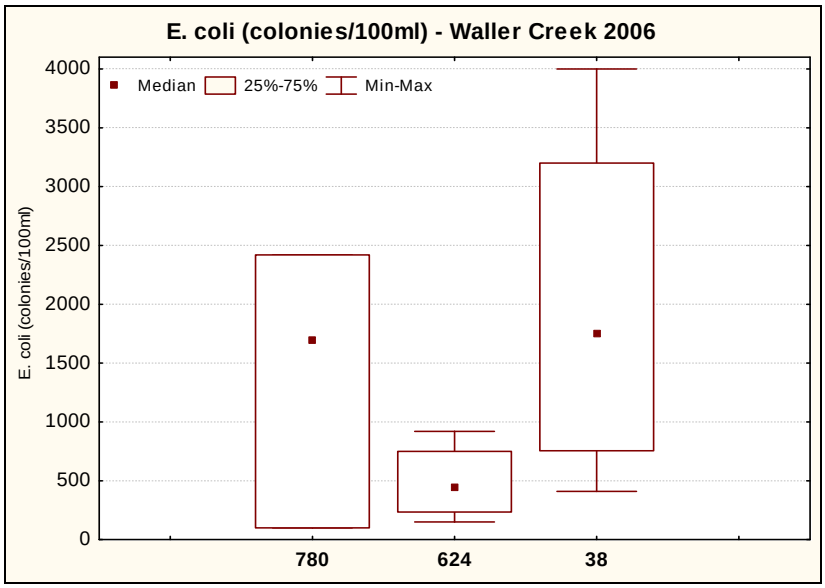


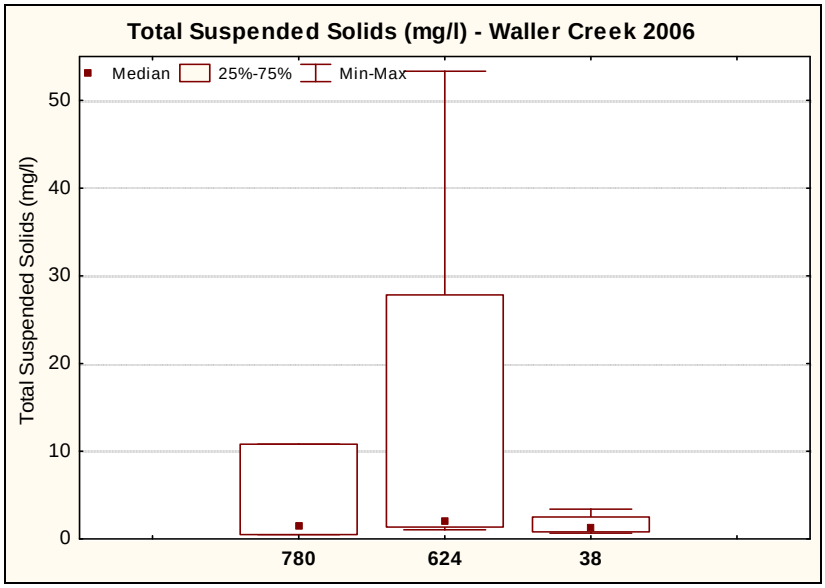


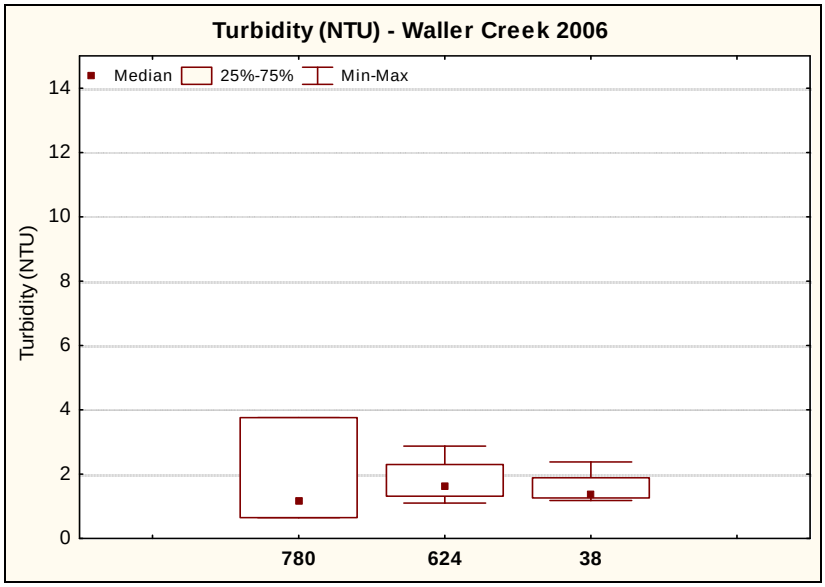


Waller Creek Watershed

Data Summary Graphs – Physical Parameters



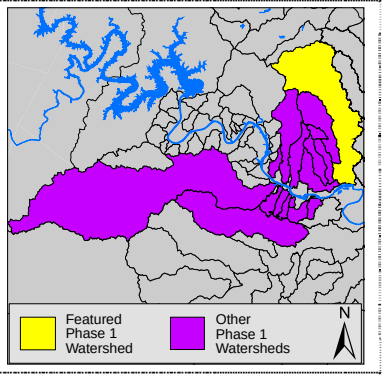




Walnut Creek Watershed

Summary Sheet

Catchment	Total area	43.5 square miles
	Area in recharge	11.9 square miles
	Creek length	22.3 miles
	Receiving water	Colorado River
Demographics	2000 population	93,934
	2030 projected population	133,387
	30 year projected % increase	42 %
Land Use	Impervious cover ('97 crwr data)	24.1 %
Overall EII Scores	2000	76
	2003	71
	2006	72



Flow Regime* for Sample Sites on Walnut Creek Upstream to Downstream

		2003					2006				
		Feb	Mar	May	Sep	Dec	Feb	May	Jul	Aug	Nov
		19	10-17	14	23	3	22	18	5-12	23	29
Site #	Site Name	WQ	Bio	WQ	WQ	WQ	WQ	WQ	Bio	WQ	WQ
463	Wells Branch at Wln Metro Park						B	B	B	B	B
895	Walnut at Metric	B	B	B	B	B	B	B	B	B	B
464	Walnut below IH 35	B	B	B	B	B	B	B	B	B	B
502	Walnut at Old Manor Rd	B	B	B	B	B	B	B	B	B	B
465	Walnut at Loyola Lane	B	B	B	B	B					
503	Walnut at SP Railroad Bridge	B	B	B	B	B	B	B	B	n	B

* B = baseflow conditions n = no flow was present Storm = storm flow was present
Blue = Samples were taken Grey = Samples were not taken Blank = site not visited

	Parameter		Mean	Max	Min	Relative concentrations compared to other 2006 Phase 1 watersheds
Physicochemical	**D.O.**	mg/l	9.2	12.1	6.6	Average[1] or above average at all sites
	pH	st.units	8.06	9.47	7.67	Most values average[1], 464 slightly above average, Site 503 with one high value
	Cond	uS/cm	607	802	492	Most values average[1], potentially a decreasing trend downstream
	SO_4	mg/l	48.0	68.5	29.0	Average[1]
Nutrients	**NH_3**	mg/l	0.03	0.14	0.01	One high reading at Site 464 in August, average[1] at all other sites
	NO_3	mg/l	0.42	1.45	0.02	Most sites high or above average in May, but average for other samples
	Ortho P	mg/l	0.04	0.12	0.02	Average[1], with one above average concentration at Site 503 in February
Sediment Load	**TSS**	mg/l	1.1	6.0	0.1	One high reading at Site 503 in May, average[1] at all other sites
	Turbidity	ntu	1.7	5.8	0.8	Consistently above average at Site 503, average[1] at all other sites
Biology	**E.Coli**	/100ml	700	4,839	17	Site 895 with very high concentrations, other sites average[1]
	Benthic Macs		Good diversity and community structure, consistently above average to high rating for most parameters			
	Diatoms		High quality. Consistent good scores for *Cymbella* richness, pollution tolerance and % similarity to reference			

[1] values for this parameter are similar to the median scores for the other 2006 Phase 1 watersheds

Discussion: Overall, Walnut maintains high integrity of aquatic life despite the below average physical integrity scores. Bacteria levels are typically good at most sites, with the exception of Site 895, which appears to be chronically elevated. The nutrient concentrations were high in May and sporadically high during other months

Sub-index scores for Walnut Creek Sites (upstream to downstream) 2000, 2003, 2006

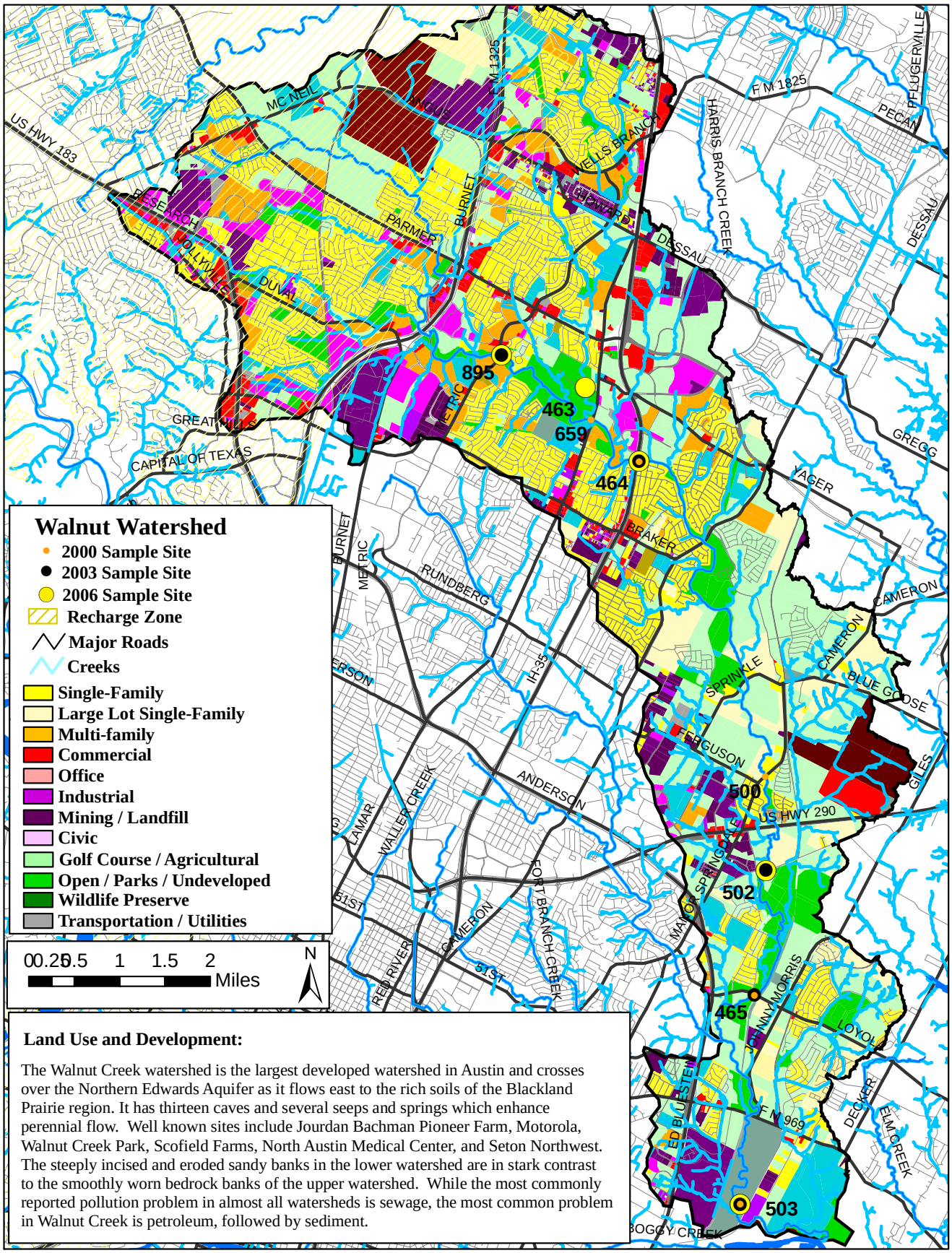
Site Number	Site 463			Site 895			Site 464			Site 502			Site 465			Site 503		
Year of Sampling	2000	2003	2006	2000	2003	2006	2000	2003	2006	2000	2003	2006	2000	2003	2006	2000	2003	2006
Water Quality			66		64	60	67	59	67		61	72	62	56		51	64	58
Sediment			82		75	82	95	75	82		75	82	95	75		95	75	82
Contact Recreation			43		51	28	90	72	56		88	59	97	88		91	86	54
Non-Contact Rec.			87		78	81	72	82	78		73	58	92	71		68	78	70
Physical Integrity			71		74	73	50	75	69		64	69	49	63		35	48	63
Aquatic Life			80		76	94	72	79	95		66	97	88	69		67	56	100
Benthic Mac.			78		88	95	87	97	93		84	100	100	87		75	69	100
Diatom			81		63	92	57	60	97		47	93	75	51		58	42	99
Total EII Score			72		70	70	74	74	75		71	73	81	70		68	68	71

* sediment samples only collected at the downstream site, blank cells indicate parameter was not collected, blank columns indicate site was dropped

100-87.5 Excellent 87.5-75 V. Good 75-62.5 Good 62.5-50 Fair 50-37.5 Marginal 37.5-25 Poor 25-12.5 Bad 12.5-0 V. Bad

Walnut Creek Watershed

Land Use Map

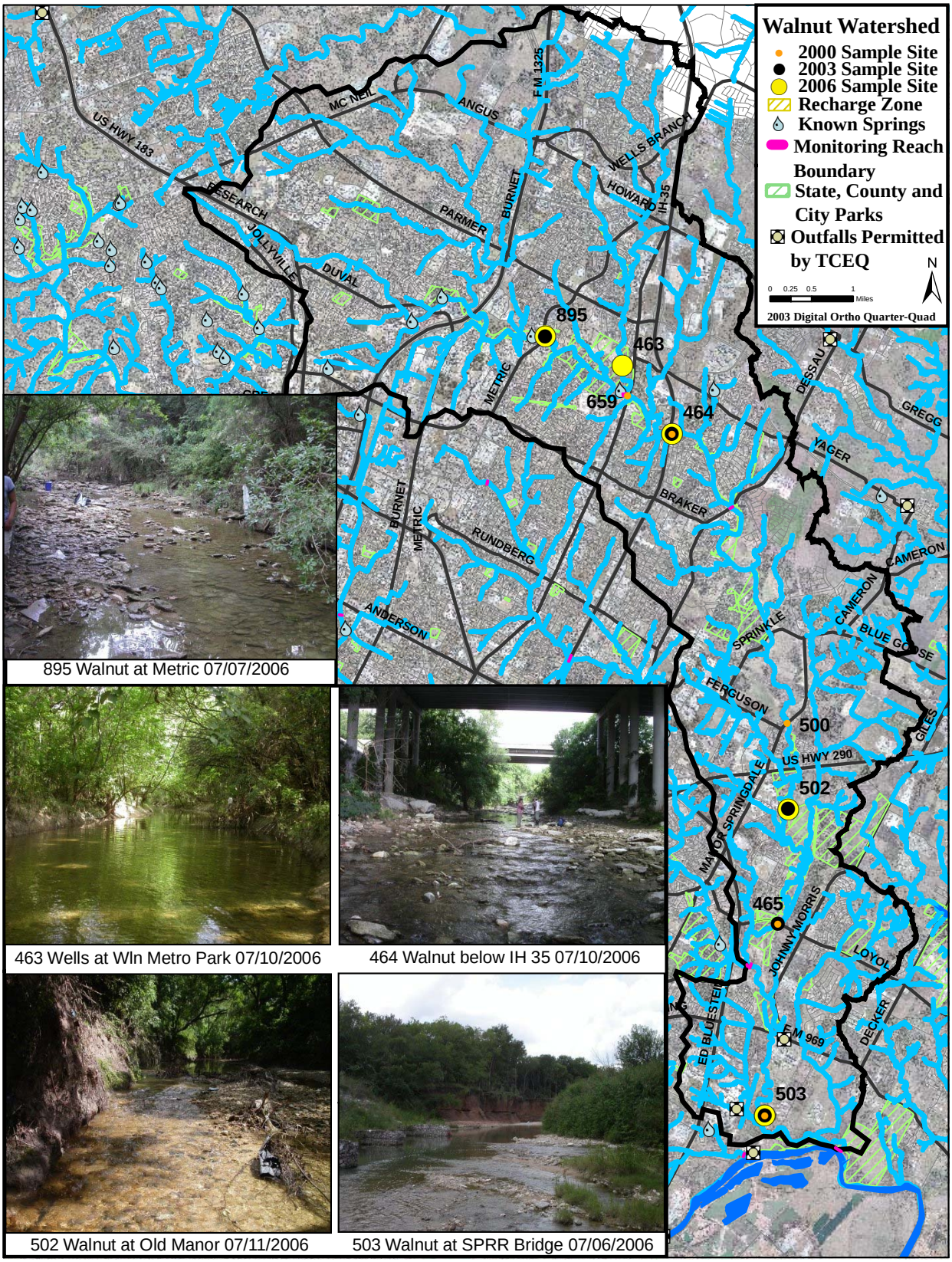


Land Use and Development:

The Walnut Creek watershed is the largest developed watershed in Austin and crosses over the Northern Edwards Aquifer as it flows east to the rich soils of the Blackland Prairie region. It has thirteen caves and several seeps and springs which enhance perennial flow. Well known sites include Jourdan Bachman Pioneer Farm, Motorola, Walnut Creek Park, Scofield Farms, North Austin Medical Center, and Seton Northwest. The steeply incised and eroded sandy banks in the lower watershed are in stark contrast to the smoothly worn bedrock banks of the upper watershed. While the most commonly reported pollution problem in almost all watersheds is sewage, the most common problem in Walnut Creek is petroleum, followed by sediment.

Walnut Creek Watershed

Aerial Map



895 Walnut at Metric 07/07/2006

463 Wells at Wln Metro Park 07/10/2006

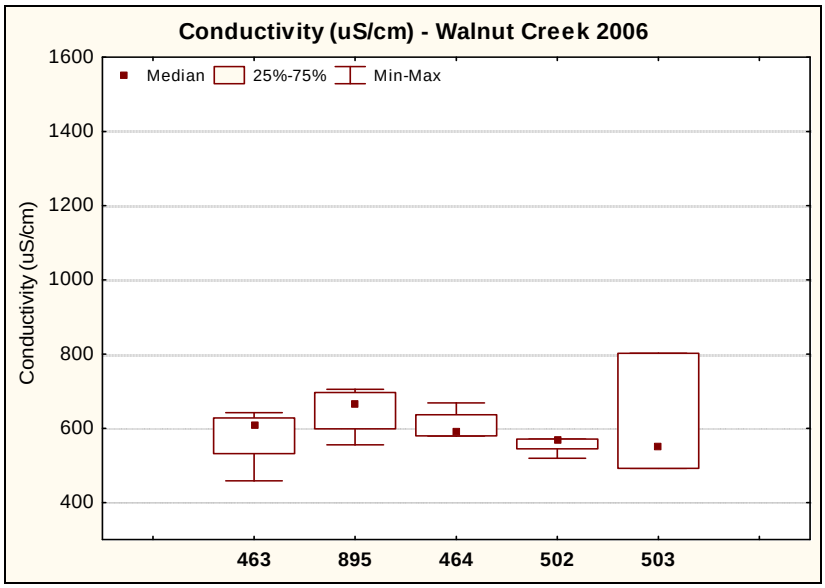
464 Walnut below IH 35 07/10/2006

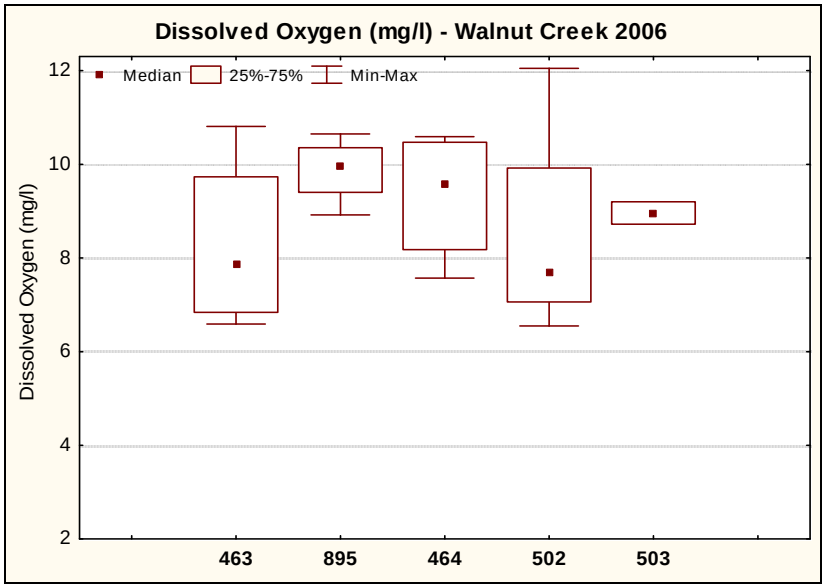
502 Walnut at Old Manor 07/11/2006

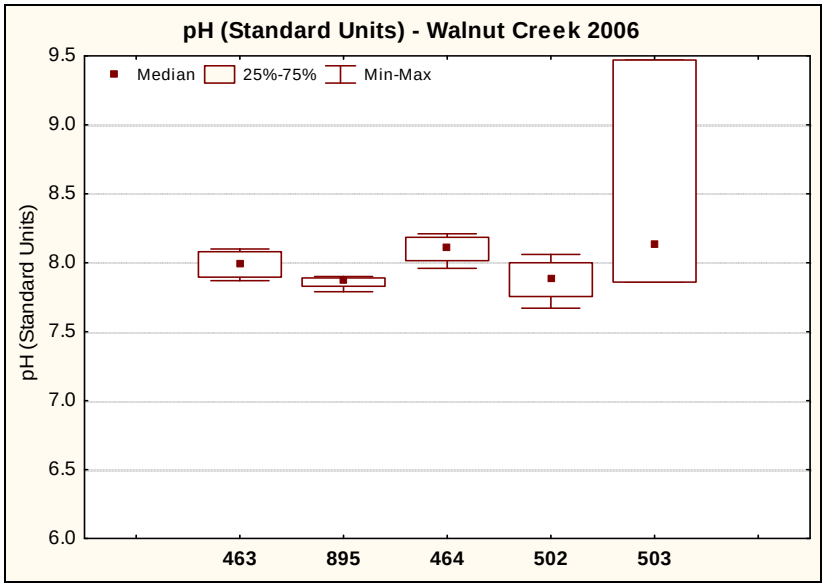
503 Walnut at SPRR Bridge 07/06/2006

Walnut Creek Watershed

Data Summary Graphs – Field Parameters

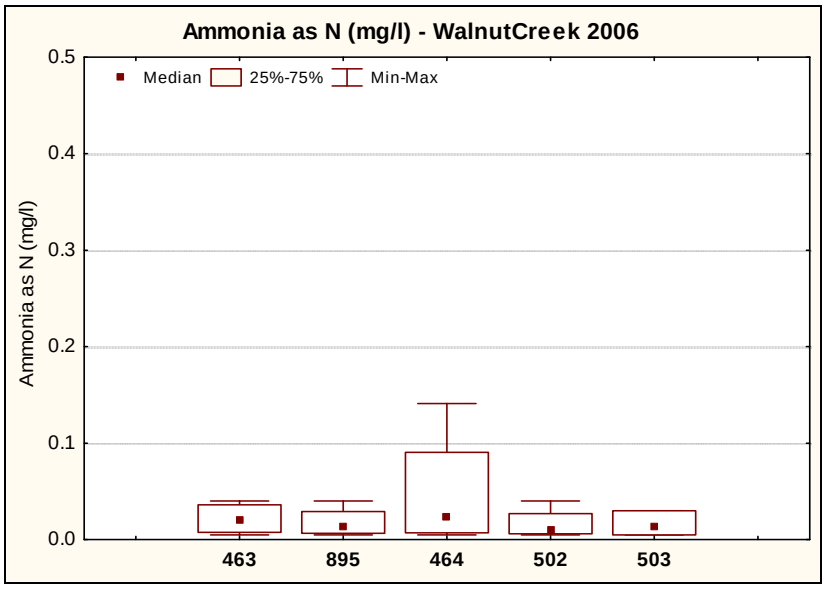


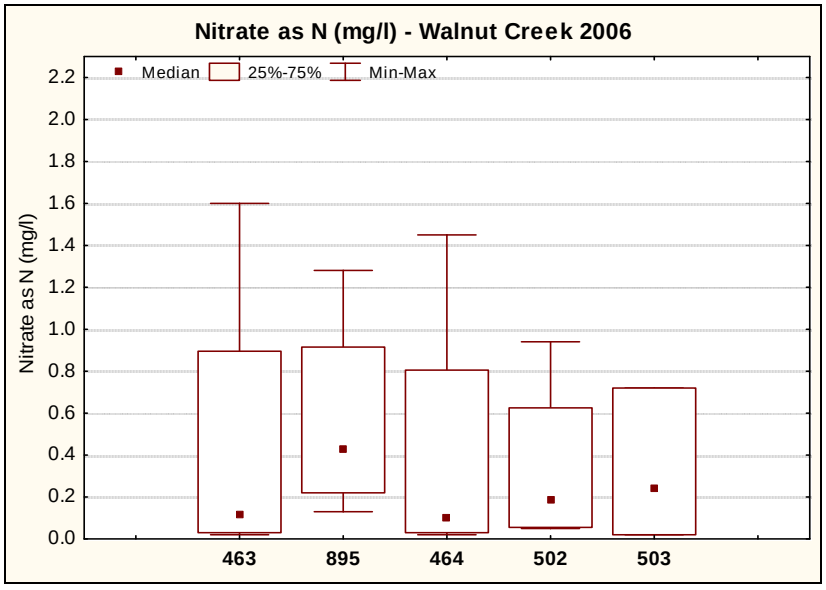


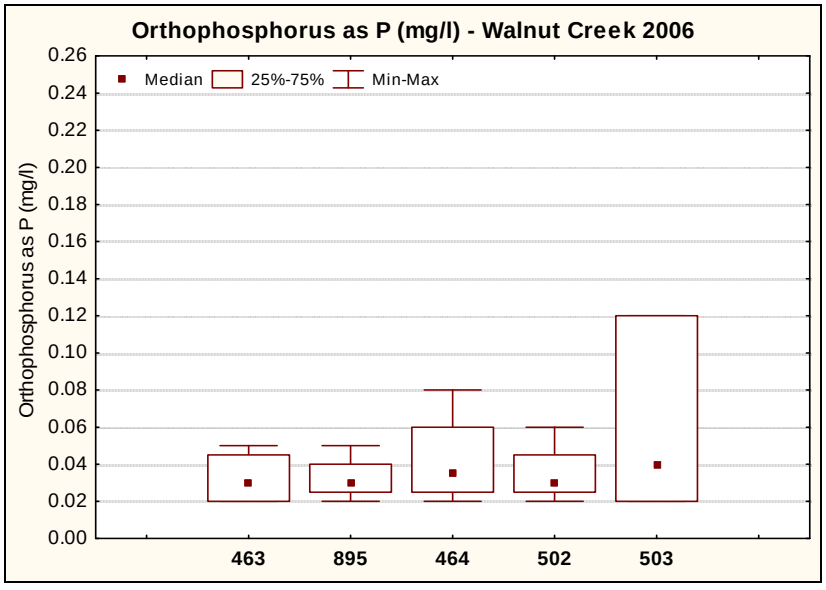


Walnut Creek Watershed

Data Summary Graphs – Nutrients

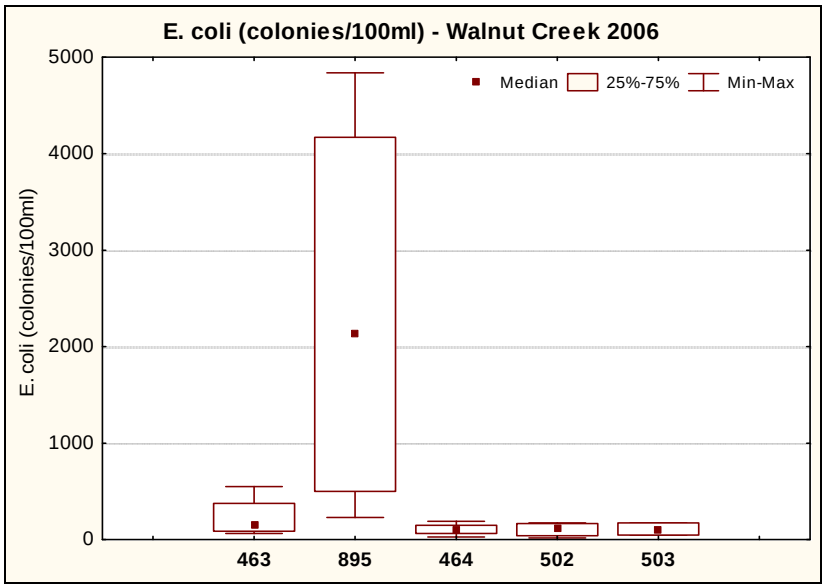


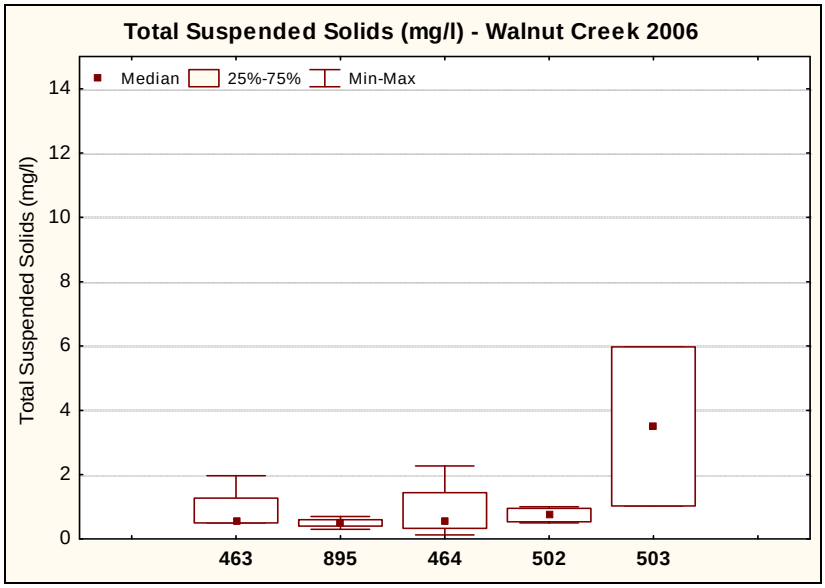


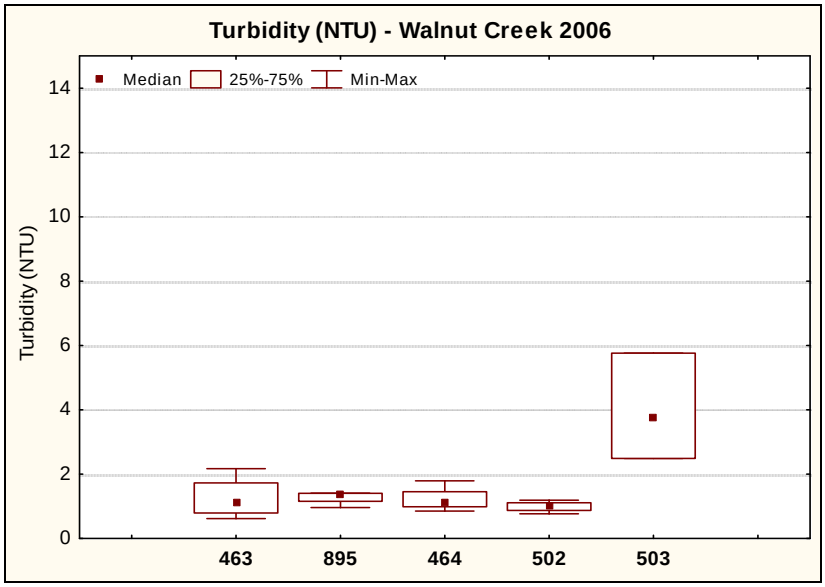


Walnut Creek Watershed

Data Summary Graphs – Physical Parameters



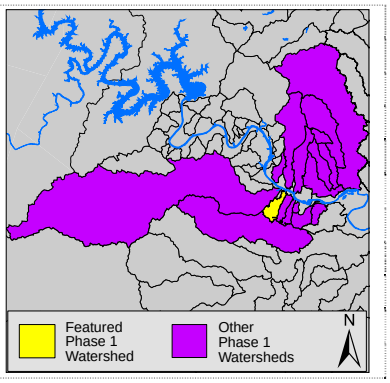




West Bouldin Creek Watershed

Summary Sheet

Catchment	Total area	3 square miles	
	Area in recharge	none	
	Creek length	4 miles	
	Receiving water	Town lake	
Demographics	2000 population	16,951	
	2030 projected population	19,337	
	30 year projected % increase	14 %	
Land Use	Impervious cover ('97 crwr data)	45.6 %	
Overall EII Scores	2000	54	
	2003	53	
	2006	56	



Flow Regime* for Sample Sites on West Bouldin Creek Upstream to Downstream

		2003					2006				
		Feb 19	Mar 10-17	May 14	Sep 23	Dec 3	Feb 22	May 18	Jul 5-12	Aug 23	Nov 29
Site #	Site Name	WQ	Bio	WQ	WQ	WQ	WQ	WQ	Bio	WQ	WQ
3856	West Bouldin at Cardinal and Locke						B	B	B	n	n
846	West Bouldin at South Austin Park	B	B	n	n	n					
3854	West Bouldin at Oltorf						B	B	B	B	B
845	West Bouldin at Guerro Park	B	B	n	n	n					
878	West Bouldin at Jewell	B	B	B	B	B					
2794	West Bouldin at Post Oak	n	B	n	n	n	n	n	n	n	n

* B = baseflow conditions n = no flow was present Storm = storm flow was present
Blue = Samples were taken Grey = Samples were not taken Blank = site not visited

	Parameter	Mean	Max	Min	Relative concentrations compared to other 2006 Phase 1 watersheds
Physicochemical	**D.O.** mg/l	12.0	13.2	8.9	All consistently high, Site 3854 had the highest mean (12.92 mg/l) of all sites
	pH st.units	8.47	9.47	7.78	Chronically high at Site 3854, above average at Site 3856
	Cond uS/cm	556	762	371	Consistently low at 3854, average[1] at Site 3856
	SO_4 mg/l	38.7	51	28.1	Average[1]
Nutrients	**NH_3** mg/l	0.02	0.03	0.01	Average[1]
	NO_3 mg/l	0.36	0.43	0.16	Average[1]
	Ortho P mg/l	0.11	0.27	0.02	Chronically above average at Site 3854, average[1] at Site 3856
Sediment Load	**TSS** mg/l	2.9	9.1	1.0	Most values average[1] with one high concentration in August at Site 3854
	Turbidity ntu	1.3	1.9	0.6	Average[1]
Biology	**E.Coli** /100ml	249	870	18	Average[1]
	Benthic Macs	Poor at 3856 (no EPT, only one intolerant taxa, 93% dominance), however, Site 3854 is above average			
	Diatoms	Site 3854 was low or below average on most parameters. Site 3856 was typically average[1]			

[1] values for this parameter are similar to the median scores for the other 2006 Phase 1 watersheds

Discussion: Despite most sites being dry for a significant portion of 2006, West Bouldin at Oltorf (Site 3854) maintained reliable baseflow, which is reflected by the good benthic macroinvertebrate score. Although dissolved oxygen levels were consistently high, water quality scores at this site were depressed by elevated OrthoP and bacteria concentrations.

Sub-index scores for West Bouldin Creek Sites (upstream to downstream) 2000, 2003, 2006

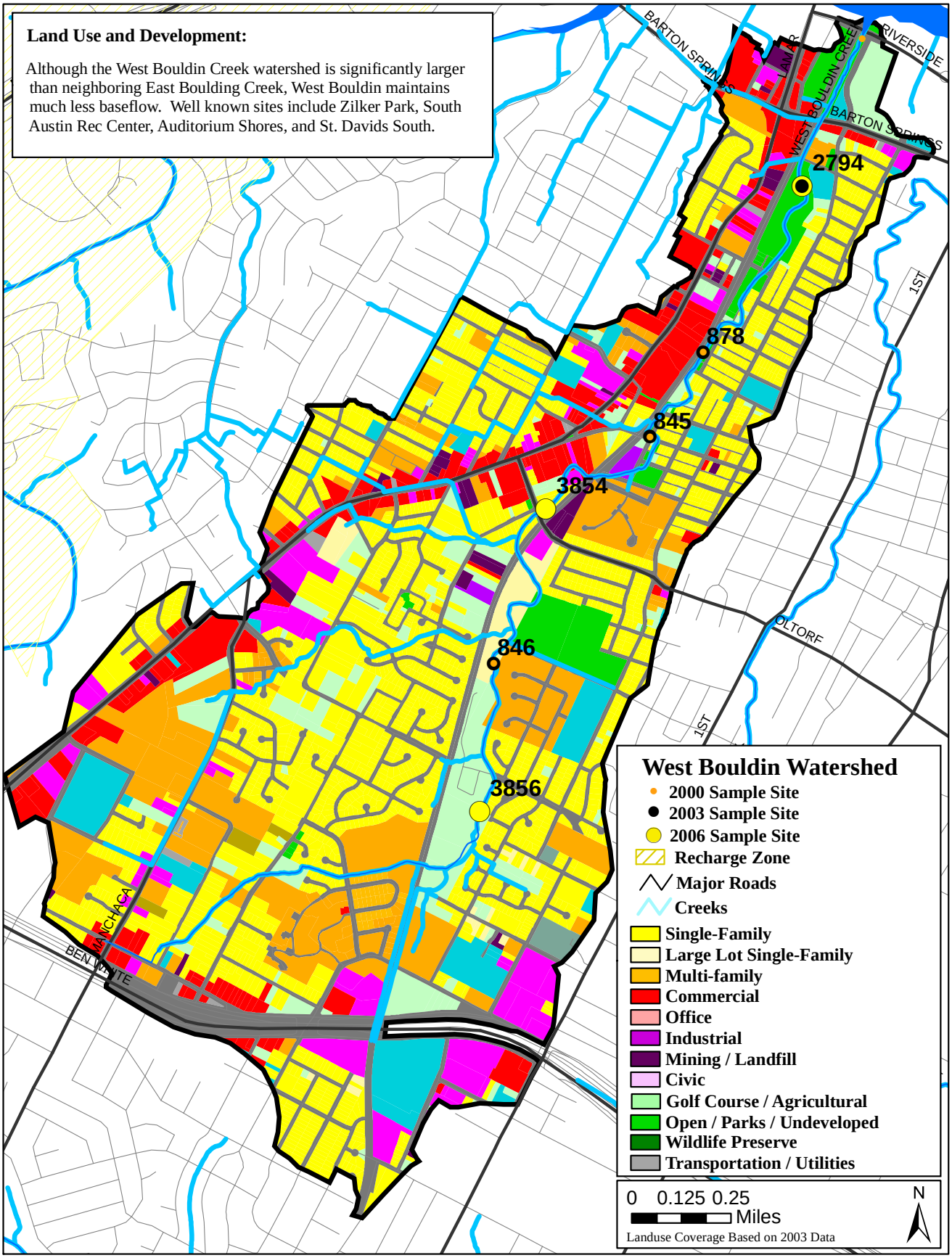
Site Number	Site 3856			Site 846			Site 3854			Site 845			Site 878			Site 2794		
Year of Sampling	2000	2003	2006	2000	2003	2006	2000	2003	2006	2000	2003	2006	2000	2003	2006	2000	2003	2006
Water Quality			55	60	38				58	75	56		67	69				
Sediment			52	80	57				52	80	57		80	57			57	52
Contact			54	76	54				48	95	25		73	83				
Non-Contact Rec.			76	46	66				77	52	80		38	58			73	62
Physical Integrity			55	44	52				52	30	44		34	40			74	75
Aquatic Life			55	31	24				69	26	29		28	31			28	
Benthic Mac.			35	25	18				82	25	26		29	27			26	
Diatom			74	36	29				56	26	31		26	34			29	
Total EII Score			58	56	49				59	60	49		53	56			58	47

* sediment samples only collected at the downstream site, blank cells indicate parameter was not collected, blank columns indicate site was dropped

100-87.5 Excellent 87.5-75 V. Good 75-62.5 Good 62.5-50 Fair 50-37.5 Marginal 37.5-25 Poor 25-12.5 Bad 12.5-0 V. Bad

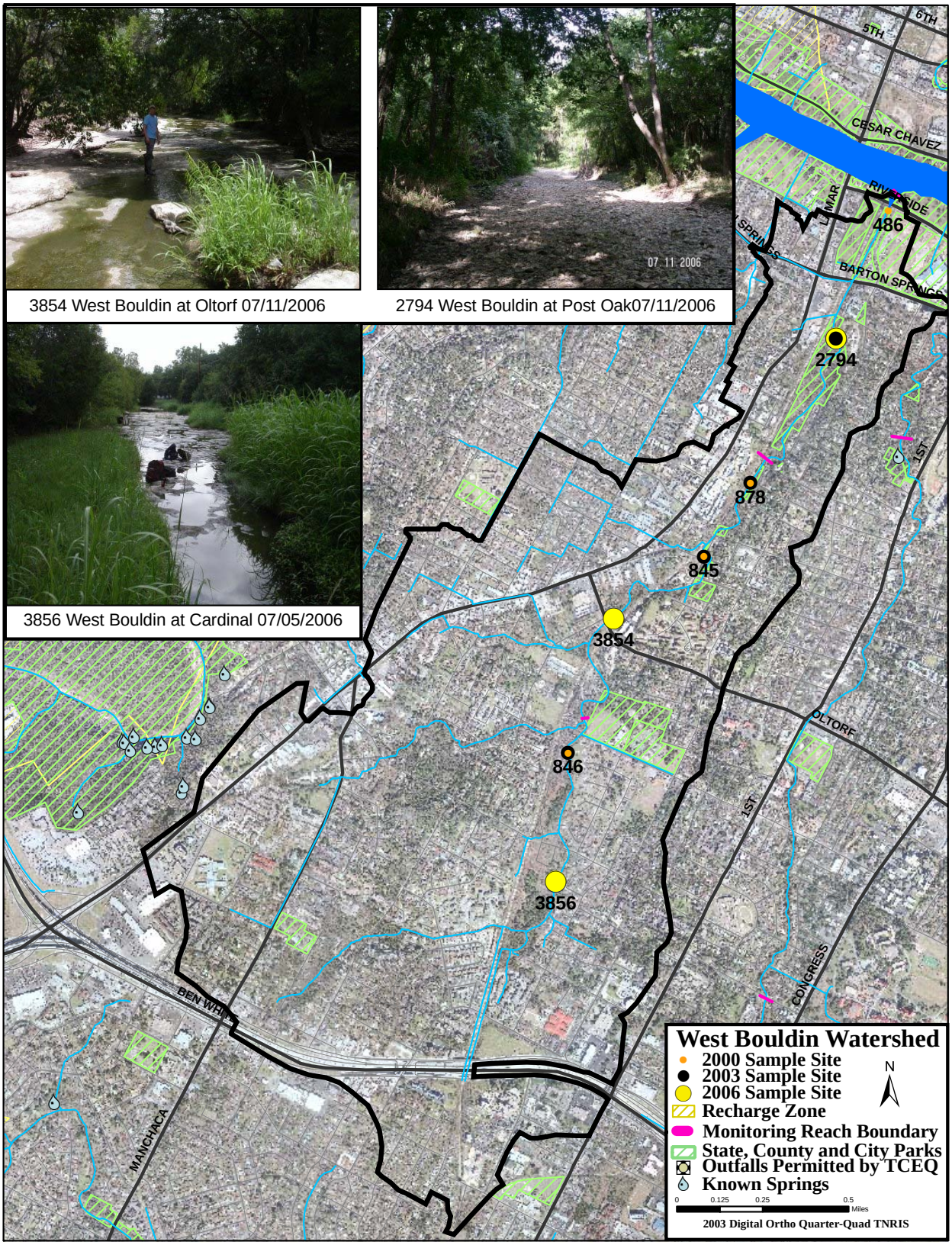
West Bouldin Creek Watershed

Land Use Map



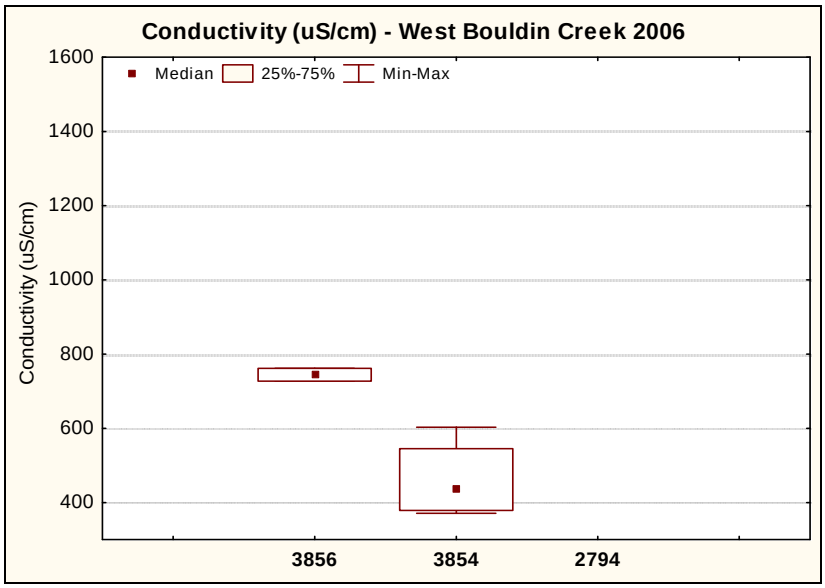
West Bouldin Creek Watershed

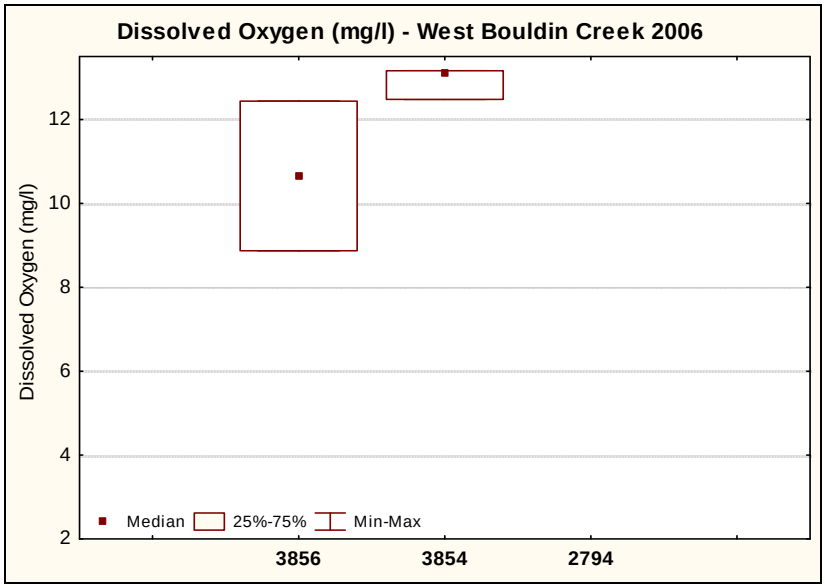
Aerial Map

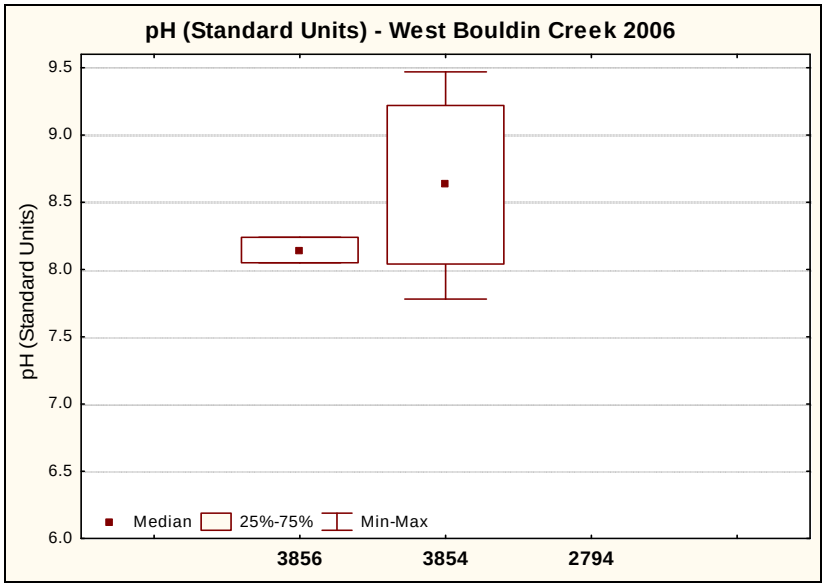


West Bouldin Creek Watershed

Data Summary Graphs – Field Parameters

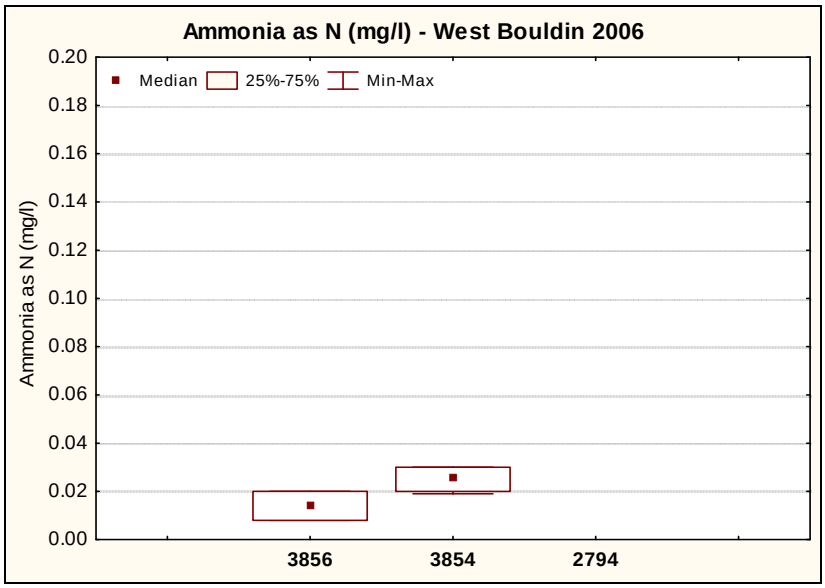


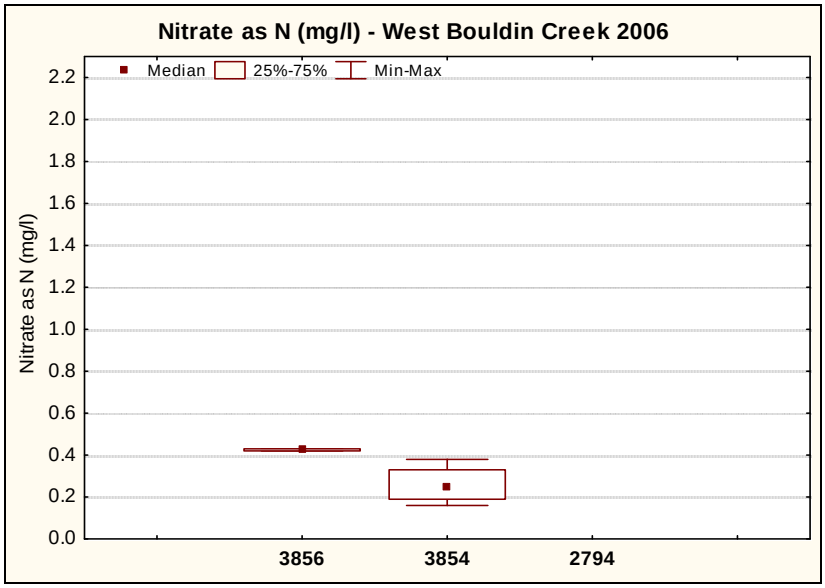


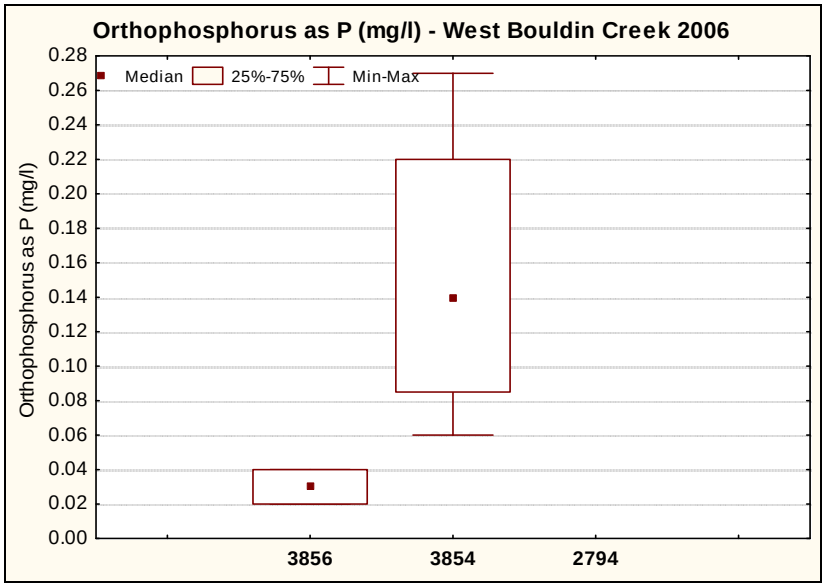


West Bouldin Creek Watershed

Data Summary Graphs – Nutrients

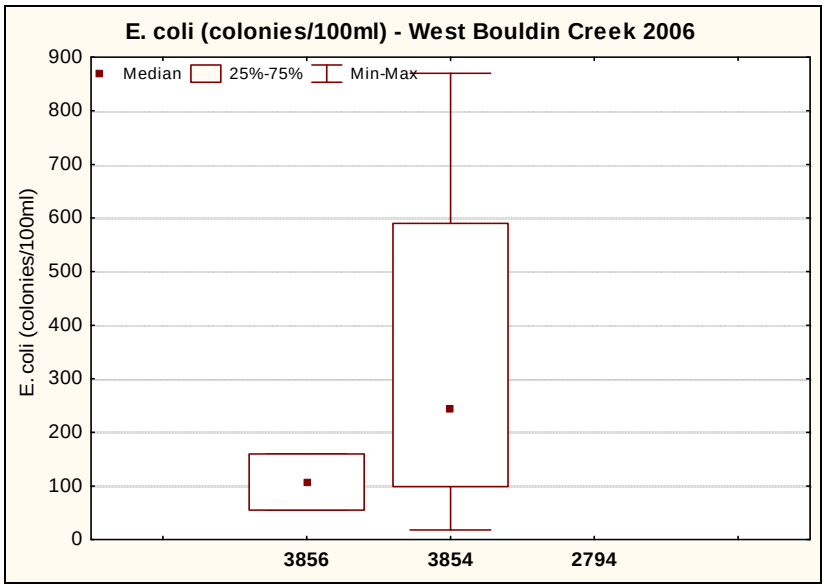


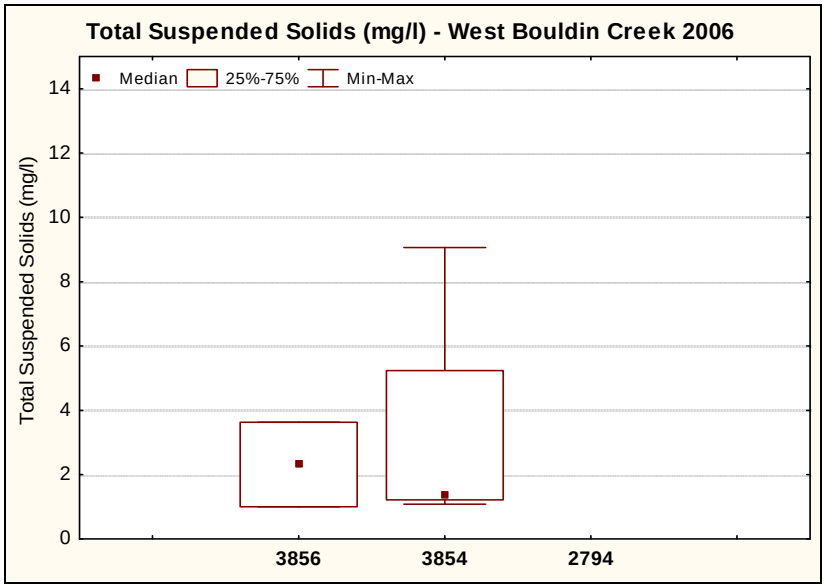


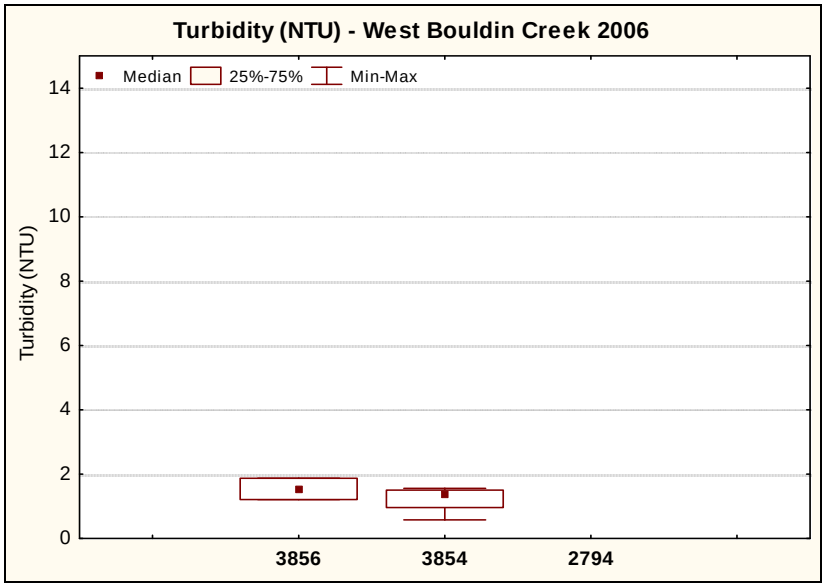


West Bouldin Creek Watershed

Data Summary Graphs – Physcial Parameters



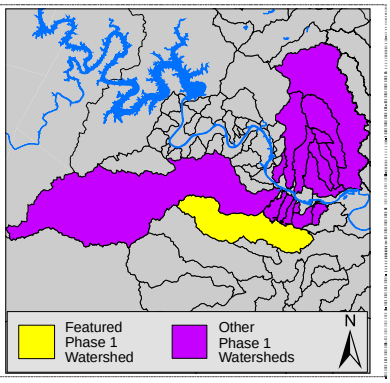




Williamson Creek Watershed

Summary Sheet

Catchment	Total area	30 square miles
	Area in recharge	8 square miles
	Creek length	19 miles
	Receiving water	Onion Creek
Demographics	2000 population	92,922
	2030 projected population	129,514
	30 year projected % increase	39%
Land Use	Impervious cover ('97 crwr data)	17.9 %
Overall EII Scores	2000	**70**
	2003	**69**
	2006	**67**



Flow Regime* for Sample Sites on Williamson Creek Upstream to Downstream

		2003					2006				
		Feb	Mar	May	Sep	Dec	Feb	May	Jul	Aug	Nov
		19	10-17	14	23	3	22	18	5-12	23	29
Site #	Site Name	WQ	Bio	WQ	WQ	WQ	WQ	WQ	Bio	WQ	WQ
490	Williamson at Hwy 71	B	B	n	n	n	n	B	B	n	n
491	Williamson at IH35	B	B	n	B	n	n	n	B	n	B
492	Williamson at Pleasant Valley	B	B	B	B	B					
223	Williamson at McKinney Falls	B	B	B	B	B	B	B	B	B	B

* B = baseflow conditions n = no flow was present Storm = storm flow was present
Blue = Samples were taken Grey = Samples were not taken Blank = site not visited

	Parameter		Mean	Max	Min	Relative concentrations compared to other 2006 Phase 1 watersheds
Physicochemical	**D.O.**	mg/l	7.3	11.5	2.6	Sites 490 and 491 were below average, while 223 was at or above average
	pH	st.units	7.73	8.02	7.53	Average[1]
	Cond	uS/cm	668	752	506	Average[1], with one low value at Site 491 in November
	SO_4	mg/l	54.4	73.6	29.2	Most sites average[1], with one above average concentration at Site 490 in May
Nutrients	**NH_3**	mg/l	0.01	0.02	0.005	Average[1]
	NO_3	mg/l	0.15	0.38	0.02	Average[1]
	Ortho P	mg/l	0.03	0.07	0.02	Average[1]
Sediment Load	**TSS**	mg/l	1.6	3.7	0.5	Most sites average[1], with one above average concentration at Site 490 in May
	Turbidity	ntu	1.3	2.0	0.9	Average[1]
Biology	**E.Coli**	/100ml	81	160	33	Consistently low concentrations of bacteria.
	Benthic Macs		Very poor at Site 490 and 491, but better than average at Site 223.			
	Diatoms		Below average at 491 above average at 223. Site 490 did not have any diatoms in the sample			

[1] values for this parameter are similar to the median scores for the other 2006 Phase 1 watersheds

Discussion: Despite poor aquatic life scores at Site 490 and 491, Williamson Creek generally had good sub-index scores. Oddly, there were no diatoms in the sample collected at Site 490. It is unclear whether there were actually no diatoms present at the site, or if there was operator error. Regardless, water quality in Williamson Creek appears to be consistently good.

Sub-index scores for Williamson Creek Sites (upstream to downstream) 2000, 2003, 2006

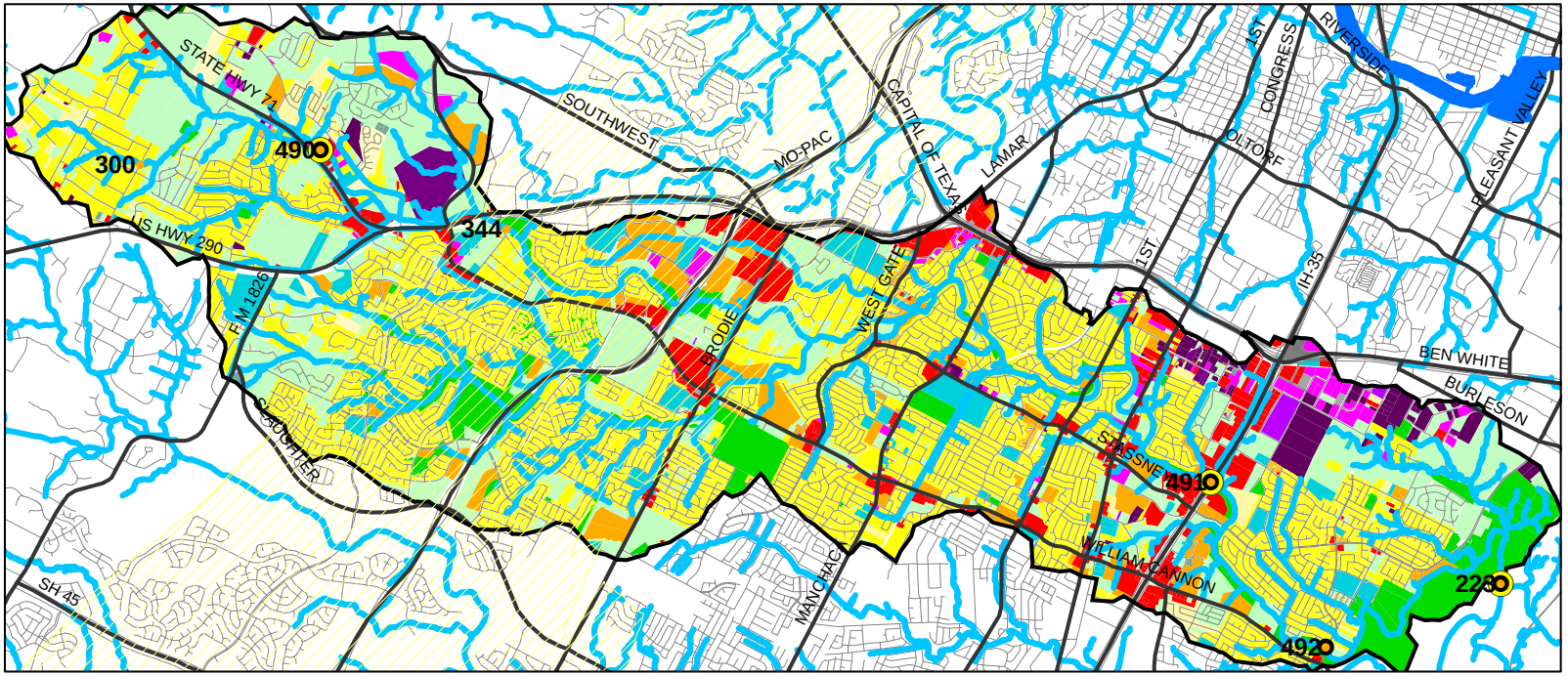
Site Number	Site 490			Site 491			Site 492			Site 223		
Year of Sampling	2000	2003	2006	2000	2003	2006	2000	2003	2006	2000	2003	2006
Water Quality	62	61	67	76	66	86	75	63		69	60	66
Sediment	92	80	76	92	80	76	92	80		92	80	76
Contact Recreation	96	85	76	88	99	80	88	84		95	89	53
Non-Contact Rec.	38	69	71	73	65	63	73	70		84	88	85
Physical Integrity	35	76	43	43	61	57	46	57		47	69	76
Aquatic Life	54	56	25	42	35	43	51	46		50	33	77
Benthic Mac.	40	46	25	29	26	33	75	42		44	20	74
Diatom	68	66		55	44	53	27	49		55	46	80
Total EII Score	63	71	60	69	68	68	71	67		73	70	72

* sediment samples only collected at the downstream site, blank cells indicate parameter was not collected, blank columns indicate site was dropped

100-87.5 Excellent 87.5-75 V. Good 75-62.5 Good 62.5-50 Fair 50-37.5 Marginal 37.5-25 Poor 25-12.5 Bad 12.5-0 V. Bad

Williamson Creek Watershed

Land Use Map



Williamson Watershed

- 2000 Sample Site
- 2003 Sample Site
- 2006 Sample Site
- Recharge Zone
- Major Roads
- Creeks

- Single-Family
- Large Lot Single-Family
- Multi-family
- Commercial
- Office
- Industrial
- Mining / Landfill
- Civic
- Golf Course / Agricultural
- Open / Parks / Undeveloped
- Wildlife Preserve
- Transportation / Utilities

N

0 1 2 Miles

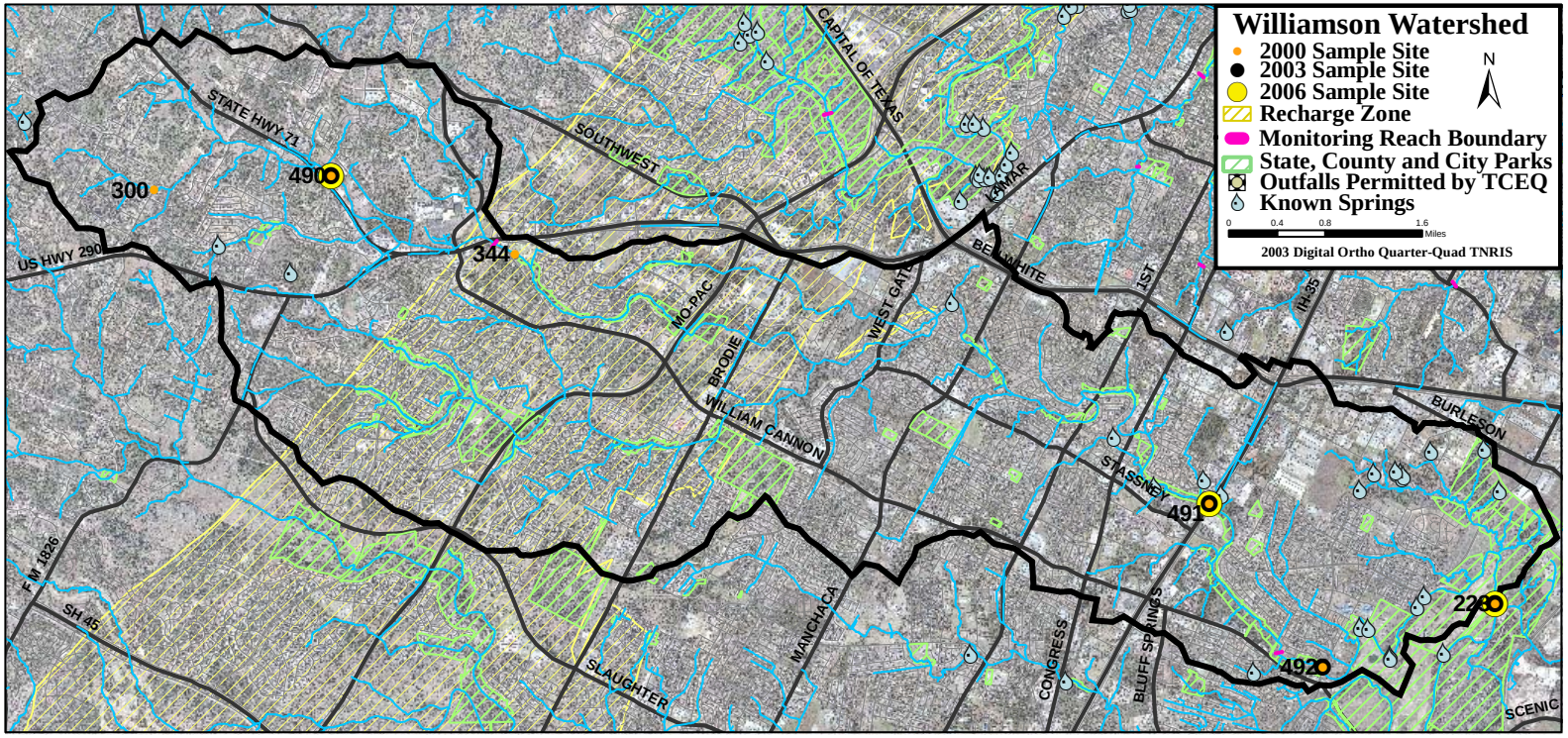
Landuse Coverage Based on 2003 Data

Land Use and Development:

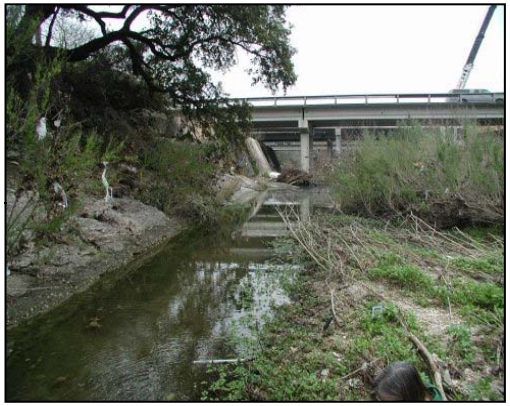
The Williamson Creek watershed is Austin's second largest suburban watershed. The upper reaches of the creek recharge the Edwards Aquifer. Streambeds above and below the recharge zone typically show perennial flow, while streambeds in the recharge zone only flow during storms. Karst features in the watershed include Whirlpool Cave, Goat Cave and District Park Cave. Other well known places in the watershed include Dick Nichols Park, Jimmy Clay Golf Course, Garrison Park, Stephenson Preserve, Blowing Sink Karst Preserve and Seton Southwest. There is a moderate amount of impervious cover (~20%) but has been developing rapidly. The near future will hold great changes for the "Y" in Oak Hill with highway improvements.

Williamson Creek Watershed

Aerial Map



490 Williamson at Hwy 71 07/07/2006

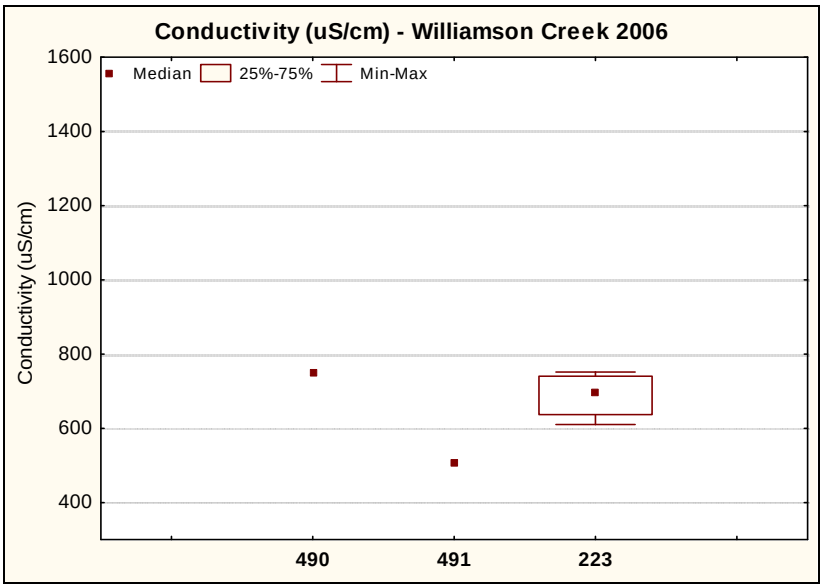


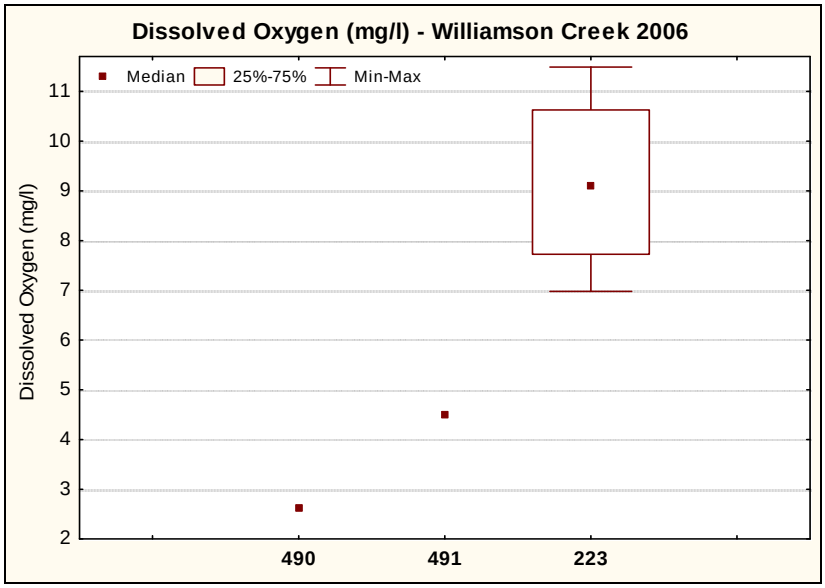
491 Williamson at IH35 03/12/2003

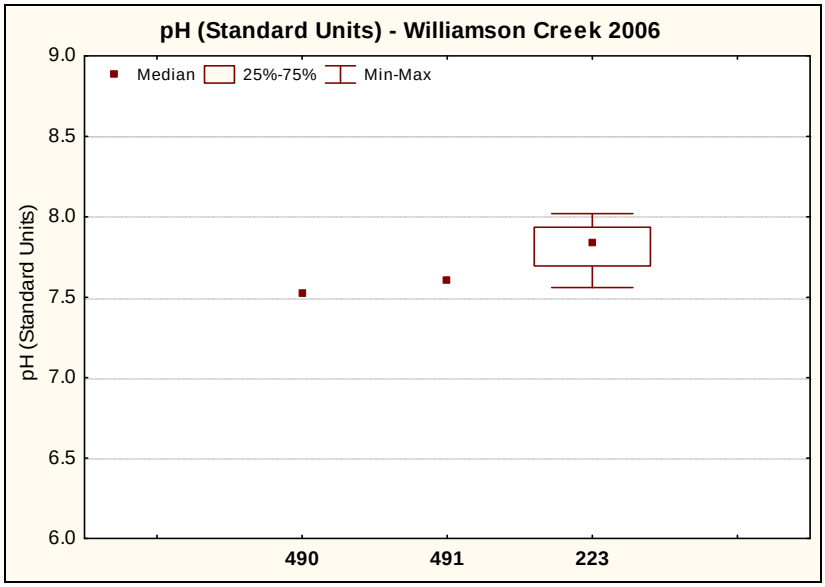
223 Williamson at McKinney Falls 03/12/2003

Williamson Creek Watershed

Data Summary Graphs – Field Parameters

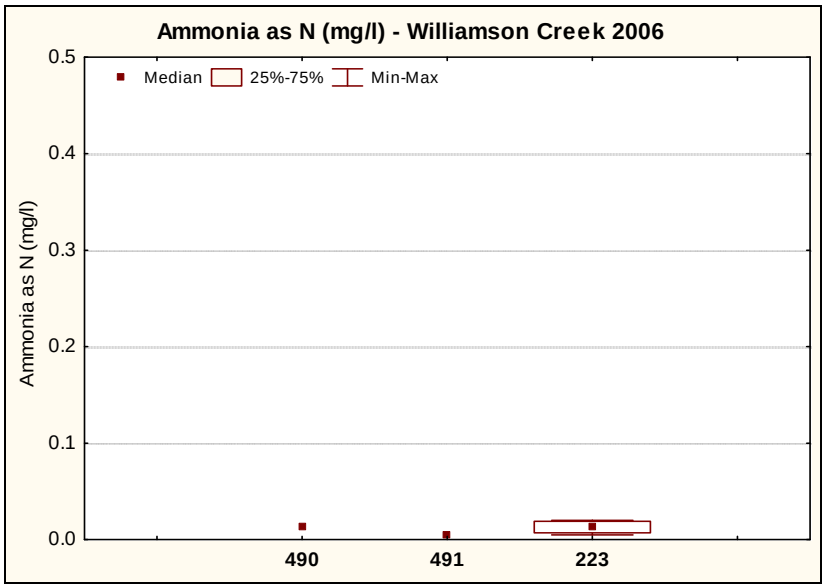


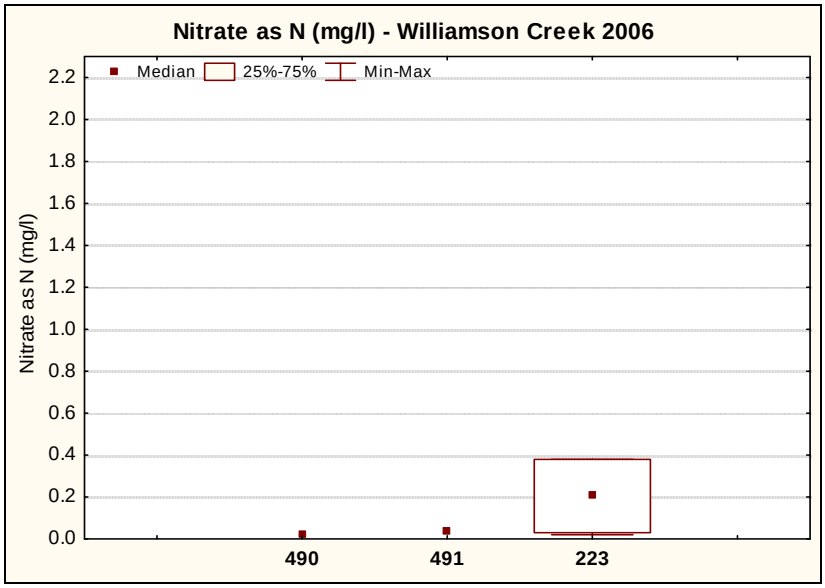


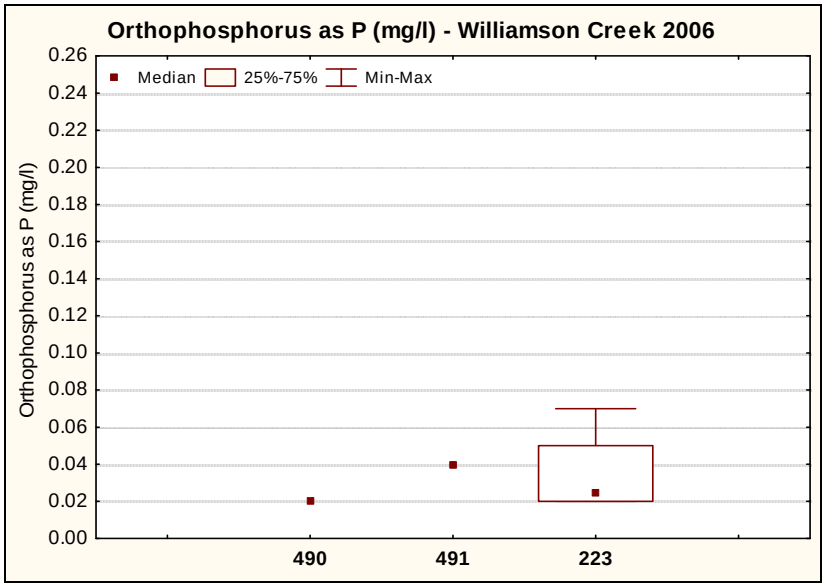


Williamson Creek Watershed

Data Summary Graphs - Nutrients

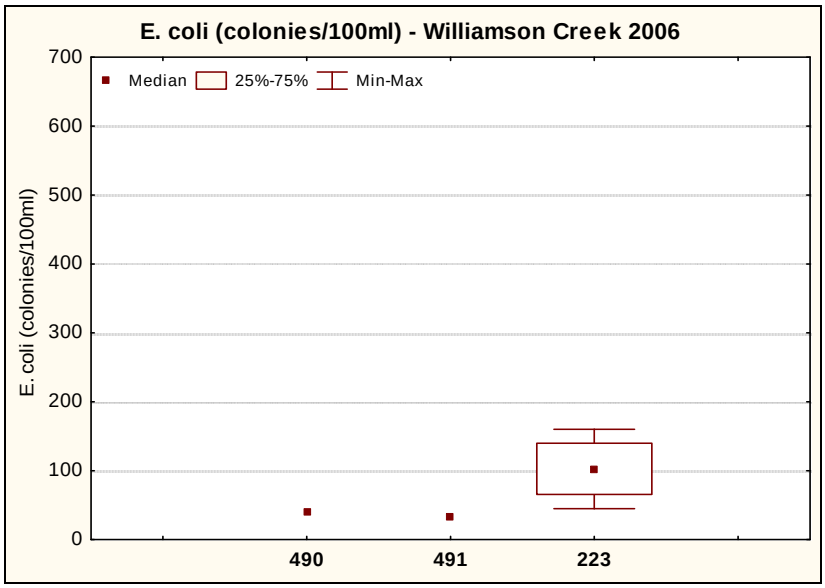


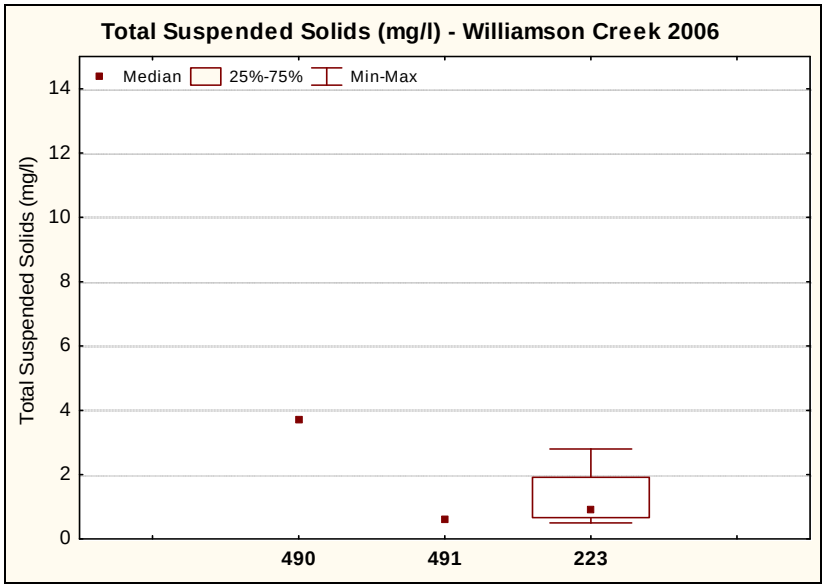


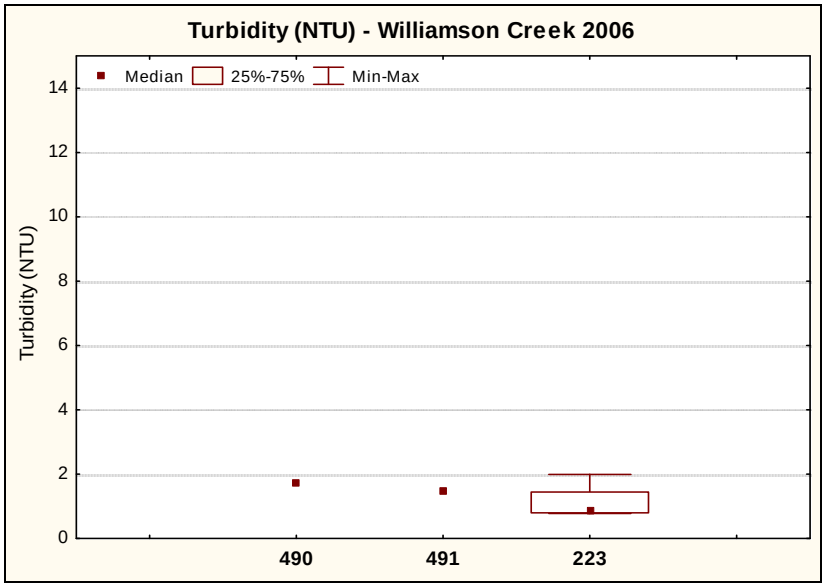


Williamson Creek Watershed

Data Summary Graphs – Physical Parameters







Appendix A:

Benthic Macroinvertebrate Data* by Site
2006 EII Phase 1

* Species lists for each site are arranged in decending order from least tolerant to most tolerant.
Pollution Tolerance Index (PTI) values are assigned to the appropriate taxonomic level as determined by theTCEQ SWQM and USEPA Rapid Bioassessment Protocols.
Color coding has been added to facilitate visual review in the following manner:

Tolerance Values ≤4 (intolerant)

Tolerance Values 5-6 (intermediant tolerance)

Tolerance Values ≥6 (tolerant)

Benthic Macroinvertebrates - Barton Creek Watershed 2006

Param	Lowest Identified Taxon	PTI	FFG	Barton at Hwy 71 below Little Barton 48 07/07/06	Barton at Ogletree Pool 49 07/11/06	Barton downstream of Lost Creek Blvd 51 07/07/06	Barton above Pool 879
343	CHIMARRA	2	FC	19	3		
806	HELICOPSYCHE	2	SC			4	
356	HEXACYLLOEPUS FERRUGINEUS	2	CG, SC		3		
363	HYDROPTILA	2	PI, SC		1	3	
366	MICROCYLLOEPUS PUSILLUS	2	CG, SC	18		22	
821	NEOELMIS CAESA	2	CG, SC		1	11	
382	THRAULODES GONZALES	2	CG, SC		4		
373	POLYCENTROPUS	3	FC, P		3	3	
1742	SURAGINA CONCINNA	3	P	3			
341	CAMELOBAETIDIUS	4	CG	11	4		
1360	FALLCEON QUILLER	4	CG	3	32	5	
501	HELICHUS	4	CG, SC	4			
920	MACRELMIS	4	CG, SC		3	3	
1523	NEOCHOROTERPES	4	CG		92		
508	PSEPHENUS	4	SC			2	
377	SIMULIUM	4	FC	7	1	1	
832	SMICRIDEA	4	FC	7	1	8	
2157	VACUPERNIUS PACKERI	4	CG	1			
334	AMBRYSUS	5	P	3	1	7	
2410	CINCINNATIA CINCINNATIENSIS	5	SC			3	
1744	DASYHELEA	5	CG, SC		1		
819	LUTROCHUS LUTEUS	5	CG	3			
518	PETROPHILA (MOTH LARVAE)	5	SC	2		2	
384	TRICORYTHODES	5	CG	13	42	46	
335	ARGIA	6	P	5	11		
2192	ARGIA IMMUNDA	6	P			29	
2193	ARGIA TRANSLATA	6	P			23	
339	BRECHMORHOGA MENDAX	6	P	5		1	
788	CHEUMATOPSYCHE	6	FC	75	7	32	
789	CHIRONOMIDAE	6	FC, P		2		
344	CHIRONOMINAE	6	FC	23		12	
346	CORBICULA FLUMINEA	6	FC			141	
2209	CORYDALUS CORNUTUS	6	P	2			
507	HETAERINA	6	P		2		
359	HYDRACARINA (ACARI)	6	P	4	1	3	
368	ORTHOCLADIINAE	6	FC			2	
1748	PLANORBELLA	6	SC	1			dry
1463	PROBEZZIA	6	P			2	
376	RHAGOVELIA	6	P	4		21	
381	TANYPODINAE	6	P			6	
1743	BEZZIA (PALPOMYIA)	7	CG, P		1		
4276	FERRISSIA	7	SC			4	
2391	HELISOMA ANCEPS	7	SC		1		
378	STENELMIS	7	CG, SC			1	
351	DUGESIA TIGRINA	7.5	CG, P		16	24	
353	EMPIDIDAE	8	CG, P	1		1	
358	HYALELLA	8	CG, SH		2		
367	OLIGOCHAETA	8	CG	4		6	
371	PHYSA (PHYSELLA)	9	SC	3	1	2	
1873	# of Organisms			221	236	433	
1877	# of Taxon	EII Sub-Index Component		24	25	29	
1880	% Dominance (top 1 Taxa)			13.12	38.98	30.94	
1886	HILSENHOFF BIOTIC INDEX	EII Sub-Index Component		4.98	4.58	5.53	
2510	# of Diptera Taxa			4	4	4	
2511	# of Ephemeroptera Taxa	EII Sub-Index Component		4	5	2	
2512	% of total as Chironomidae	EII Sub-Index Component		10.4	0.84	4.61	
2513	% of total as Elmidae			8.14	2.96	8.54	
2514	# of Noninsect Taxa			4	5	7	
2515	# of EPT Taxa	EII Sub-Index Component		7	10	7	
2516	% of total as EPT	EII Sub-Index Component		58.37	80.08	23.32	
2517	% of total as Collector/Gatherer			26.24	85.16	27.48	
2518	% of total as Predator	EII Sub-Index Component		22.62	15.67	31.4	
2519	% of total as Filterers			59.27	7.2	47.34	
2520	% of total as Grazers (PI and SC)			12.66	6.35	13.39	
2521	% of Trichoptera as Hydropsychidae			81.18	53.33	80	
2522	Ratio or Intolerant to Tolerant Organisms			0.74	4.36	0.38	
2523	# of Intolerant Taxa	EII Sub-Index Component		9	12	10	
2524	% of total as Tolerant Organisms			1.35	0.42	0.46	
2525	% Dominance (top 3 Taxa)	EII Sub-Index Component		29.41	70.33	42.03	
2526	% of total as Dominant Guild (FFG)			59.27	85.16	47.34	
2759	EPT/EPT+Chironomidae			0.849	0.99	0.835	
3159	TCEQ QuantitativeAquatic Life Use Score			33	31	29	
3160	TCEQ Qualitative Aquatic Life Use Score			31	33	31	

Benthic Macroinvertebrates - Blunn Creek Watershed 2006

Param	Lowest Identified Taxon	PTI	FFG	Blunn at Long Bow 362 07/11/06	Blunn above Big Stacy Pool 364 07/05/06	Blunn at Riverside Drive 180 07/11/06
1360	FALLCEON QUILLER	4	CG	72	88	67
335	ARGIA	6	P	42	29	26
1458	ATRICHOPOGON	6	P	1		
339	BRECHMORHOGA MENDAX	6	P	2	3	4
788	CHEUMATOPSYCHE	6	FC	7		2
789	CHIRONOMIDAE	6	FC, P	9	16	62
799	DIPTERA (MIDGE/FLY LARVAE)	6	CG, FC, P, SC, SH		1	
808	HEMERODROMIA	6	CG, P		1	
376	RHAGOVELIA	6	P	1		1
381	TANYPODINAE	6	P	2	11	20
953	CALOPARYPHUS	7	CG			1
4276	FERRISSIA	7	SC		8	8
351	DUGESIA TIGRINA	7.5	CG, P	1	70	15
357	HIRUDINEA	8	P			2
367	OLIGOCHAETA	8	CG	2	30	3
371	PHYSA (PHYSELLA)	9	SC	1	1	2
1873	# of Organisms			140	258	213
1877	# of Taxon	EII Sub-Index Component		10	10	12
1880	% Dominance (top 1 Taxa)			51.42	34.1	31.45
1886	HILSENHOFF BIOTIC INDEX	EII Sub-Index Component		5.03	6	5.59
2510	# of Diptera Taxa			2	3	2
2511	# of Ephemeroptera Taxa	EII Sub-Index Component		1	1	1
2512	% of total as Chironomidae	EII Sub-Index Component		7.85	10.46	38.49
2513	% of total as Elmidae			0	0	0
2514	# of Noninsect Taxa			3	4	5
2515	# of EPT Taxa	EII Sub-Index Component		2	1	2
2516	% of total as EPT	EII Sub-Index Component		56.42	34.1	32.39
2517	% of total as Collector/Gatherer			53.57	73.64	40.37
2518	% of total as Predator	EII Sub-Index Component		41.42	50.77	61.03
2519	% of total as Filterers			12.85	10.85	39.43
2520	% of total as Grazers (PI and SC)			0.71	3.87	4.69
2521	% of Trichoptera as Hydropsychidae			100	0	100
2522	Ratio or Intolerant to Tolerant Organisms			1.05	0.51	0.45
2523	# of Intolerant Taxa	EII Sub-Index Component		1	1	1
2524	% of total as Tolerant Organisms			0.71	0.38	0.93
2525	% Dominance (top 3 Taxa)	EII Sub-Index Component		87.85	72.86	72.76
2526	% of total as Dominant Guild (FFG)			53.57	73.64	61.03
2759	EPT/EPT+Chironomidae			0.878	0.765	0.457
3159	TCEQ QuantitativeAquatic Life Use Score			25	23	23
3160	TCEQ Qualitative Aquatic Life Use Score			18	17	17

Benthic Macroinvertebrates - Boggy Creek Watershed 2006

Param	Lowest Identified Taxon	PTI	FFG	Boggy (North) at Manor Rd 2754 07/10/06	Boggy (North) at Nile Street 837 07/06/06	Boggy (North) at Delwau Lane 493 07/06/06
1755	CALLIBAETIS	4	CG		1	2
1470	DOLICHOPODIDAE	4	P		1	
1360	FALLCEON QUILLER	4	CG		59	2
832	SMICRIDEA	4	FC	1		
1744	DASYHELEA	5	CG, SC	2	3	2
1757	TRICHOCORIXA	5	CG, P			2
384	TRICORYTHODES	5	CG			1
335	ARGIA	6	P	5	5	4
789	CHIRONOMIDAE	6	FC, P	12	150	178
801	EPHYDRIDAE	6	P			1
359	HYDRACARINA (ACARI)	6	P		1	
381	TANYPODINAE	6	P	5	8	5
340	CAENIS	7	CG, SC			1
4276	FERRISSIA	7	SC	1		
351	DUGESIA TIGRINA	7.5	CG, P	1	2	
357	HIRUDINEA	8	P		1	
358	HYALELLA	8	CG, SH		1	
367	OLIGOCHAETA	8	CG	25	9	4
371	PHYSA (PHYSELLA)	9	SC	3	4	
1873	# of Organisms			55	245	202
1877	# of Taxon	EII Sub-Index Component		8	12	10
1880	% Dominance (top 1 Taxa)			45.45	61.22	88.11
1886	HILSENHOFF BIOTIC INDEX	EII Sub-Index Component		7.04	5.64	5.98
2510	# of Diptera Taxa			2	3	3
2511	# of Ephemeroptera Taxa	EII Sub-Index Component		0	2	4
2512	% of total as Chironomidae	EII Sub-Index Component		30.9	64.48	90.59
2513	% of total as Elmidae			0	0	0
2514	# of Noninsect Taxa			4	6	1
2515	# of EPT Taxa	EII Sub-Index Component		1	2	4
2516	% of total as EPT	EII Sub-Index Component		1.81	24.48	2.97
2517	% of total as Collector/Gatherer			50.9	30.61	6.93
2518	% of total as Predator	EII Sub-Index Component		41.81	68.57	94.05
2519	% of total as Filterers			32.72	64.48	90.59
2520	% of total as Grazers (PI and SC)			10.9	2.85	1.48
2521	% of Trichoptera as Hydropsychidae			100	0	0
2522	Ratio or Intolerant to Tolerant Organisms			0.05	0.35	0.04
2523	# of Intolerant Taxa	EII Sub-Index Component		1	3	2
2524	% of total as Tolerant Organisms			5.45	1.63	0
2525	% Dominance (top 3 Taxa)	EII Sub-Index Component		76.36	88.97	92.07
2526	% of total as Dominant Guild (FFG)			50.9	68.57	94.05
2759	EPT/EPT+Chironomidae			0.056	0.275	0.032
3159	TCEQ QuantitativeAquatic Life Use Score			19	19	15
3160	TCEQ Qualitative Aquatic Life Use Score			16	17	14

Benthic Macroinvertebrates - Buttermilk Creek Watershed 2006

Param	Lowest Identified Taxon	PTI	FFG	Buttermilk at VCC 3861 07/05/06	Buttermilk at Providence Ave 782 07/05/06	Buttermilk at Little Walnut Creek 851 07/10/06
363	HYDROPTILA	2	PI, SC		4	2
1755	CALLIBAETIS	4	CG		1	
341	CAMELOBAETIDIUS	4	CG		2	19
1360	FALLCEON QUILLER	4	CG	12	3	6
369	OSTRACODA	4	CG, FC			5
377	SIMULIUM	4	FC			1
518	PETROPHILA (MOTH LARVAE)	5	SC			2
335	ARGIA	6	P	5	9	20
339	BRECHMORHOGA MENDAX	6	P			10
788	CHEUMATOPSYCHE	6	FC		2	4
789	CHIRONOMIDAE	6	FC, P	129	28	17
507	HETAERINA	6	P			3
818	LIMONIA	6	SH			1
381	TANYPODINAE	6	P	9	34	5
4276	FERRISSIA	7	SC	2		
378	STENELMIS	7	CG, SC		1	1
351	DUGESIA TIGRINA	7.5	CG, P			7
781	ANOPHELES	8	FC	2		
353	EMPIDIDAE	8	CG, P			1
804	EUPARYPHUS	8	CG, SC			8
357	HIRUDINEA	8	P	7	2	
367	OLIGOCHAETA	8	CG		1	2
504	TIPULA	8	CG, SH			1
371	PHYSA (PHYSELLA)	9	SC		70	
509	LACCOPHILUS	10	P		2	
2334	TROPISTERNUS (ADULT)	10	CG	1		
1873	# of Organisms			167	159	115
1877	# of Taxon	EII Sub-Index Component		7	12	18
1880	% Dominance (top 1 Taxa)			77.24	44.02	17.39
1886	HILSENHOFF BIOTIC INDEX	EII Sub-Index Component		6	7.23	5.68
2510	# of Diptera Taxa			2	1	6
2511	# of Ephemeroptera Taxa	EII Sub-Index Component		1	3	2
2512	% of total as Chironomidae	EII Sub-Index Component		82.63	38.99	19.13
2513	% of total as Elmidae			0	0.62	0.86
2514	# of Noninsect Taxa			2	3	3
2515	# of EPT Taxa	EII Sub-Index Component		1	5	4
2516	% of total as EPT	EII Sub-Index Component		7.18	7.54	26.95
2517	% of total as Collector/Gatherer			7.78	5.03	43.47
2518	% of total as Predator	EII Sub-Index Component		89.82	47.16	54.78
2519	% of total as Filterers			83.83	40.25	27.82
2520	% of total as Grazers (PI and SC)			1.19	47.16	11.3
2521	% of Trichoptera as Hydropsychidae			0	33.33	66.66
2522	Ratio or Intolerant to Tolerant Organisms			0.07	0.06	0.43
2523	# of Intolerant Taxa	EII Sub-Index Component		1	4	5
2524	% of total as Tolerant Organisms			0.59	45.28	0
2525	% Dominance (top 3 Taxa)	EII Sub-Index Component		88.62	71.06	48.69
2526	% of total as Dominant Guild (FFG)			89.82	47.16	54.78
2759	EPT/EPT+Chironomidae			0.08	0.162	0.585
3159	TCEQ QuantitativeAquatic Life Use Score			15	17	25
3160	TCEQ Qualitative Aquatic Life Use Score			13	18	20

Benthic Macroinvertebrates - Country Club Creek Watershed 2006

Param	Lowest Identified Taxon	PTI	FFG	Country Club (West) at East Oltorf St 850 07/06/06	Country Club (West) at Krieg Fields 1474	Country Club (East) at ACC 1475
363	HYDROPTILA	2	PI, SC	4		
1360	FALLCEON QUILLER	4	CG	27		
369	OSTRACODA	4	CG, FC	3		
335	ARGIA	6	P	11		
789	CHIRONOMIDAE	6	FC, P	86		
1463	PROBEZZIA	6	P	1		
381	TANYPODINAE	6	P	8		
953	CALOPARYPHUS	7	CG	1		
4276	FERRISSIA	7	SC	3		
351	DUGESIA TIGRINA	7.5	CG, P	2		
367	OLIGOCHAETA	8	CG	2		
371	PHYSA (PHYSELLA)	9	SC	4		
835	TROPISTERNUS (LARVA)	10	P	1		
1873	# of Organisms			153		
1877	# of Taxon	EII Sub-Index Component		12		
1880	% Dominance (top 1 Taxa)			56.2		
1886	HILSENHOFF BIOTIC INDEX	EII Sub-Index Component		5.67		
2510	# of Diptera Taxa			3		
2511	# of Ephemeroptera Taxa	EII Sub-Index Component		1	dry	dry
2512	% of total as Chironomidae	EII Sub-Index Component		61.43		
2513	% of total as Elmidae			0		
2514	# of Noninsect Taxa			5		
2515	# of EPT Taxa	EII Sub-Index Component		2		
2516	% of total as EPT	EII Sub-Index Component		20.26		
2517	% of total as Collector/Gatherer			22.87		
2518	% of total as Predator	EII Sub-Index Component		71.24		
2519	% of total as Filterers			63.39		
2520	% of total as Grazers (PI and SC)			7.18		
2521	% of Trichoptera as Hydropsychidae			0		
2522	Ratio or Intolerant to Tolerant Organisms			0.28		
2523	# of Intolerant Taxa	EII Sub-Index Component		3		
2524	% of total as Tolerant Organisms			3.26		
2525	% Dominance (top 3 Taxa)	EII Sub-Index Component		81.04		
2526	% of total as Dominant Guild (FFG)			71.24		
2759	EPT/EPT+Chironomidae			0.248		
3159	TCEQ QuantitativeAquatic Life Use Score			19		
3160	TCEQ Qualitative Aquatic Life Use Score			17		

Benthic Macroinvertebrates - East Bouldin Creek Watershed 2006

Param	Lowest Identified Taxon	PTI	FFG	East Bouldin d/s of W. Alpine Rd 121 07/05/06	East Bouldin at Elizabeth St 119 07/05/06	East Bouldin at Post Oak 1338 07/06/06
1755	CALLIBAETIS	4	CG	16		
794	COPEPODA	4	SC	5		
1360	FALLCEON QUILLER	4	CG		146	25
369	OSTRACODA	4	CG, FC		2	1
779	ANAX	5	P	1		
1744	DASYHELEA	5	CG, SC		1	
518	PETROPHILA (MOTH LARVAE)	5	SC		1	
335	ARGIA	6	P		44	
339	BRECHMORHOGA MENDAX	6	P		1	
788	CHEUMATOPSYCHE	6	FC		1	2
789	CHIRONOMIDAE	6	FC, P	1159	57	13
2127	ENALLAGMA	6	P	7		
359	HYDRACARINA (ACARI)	6	P	3		
2293	HYDROBIUS (ADULT)	6	CG	4		
381	TANYPODINAE	6	P	8	7	10
953	CALOPARYPHUS	7	CG			2
4276	FERRISSIA	7	SC		1	
1746	GYRAULUS	7	SC		1	
378	STENELMIS	7	CG, SC		1	
1110	TABANUS	7	P	1		
351	DUGESIA TIGRINA	7.5	CG, P		7	
357	HIRUDINEA	8	P	1	1	
497	LIBELLULA	8	P	1		
367	OLIGOCHAETA	8	CG	112	37	18
1086	COPELATUS	9	P	3		
873	LIBELLULIDAE	9	P	4		
371	PHYSA (PHYSELLA)	9	SC	300	2	2
1201	CULEX	10	FC	9		
509	LACCOPHILUS	10	P	26		1
1112	SCIOMYZIDAE	10	P	4		
2334	TROPISTERNUS (ADULT)	10	CG	1		
1873	# of Organisms			1665	310	74
1877	# of Taxon		EII Sub-Index Component	18	15	8
1880	% Dominance (top 1 Taxa)			69.6	47.09	33.78
1886	HILSENHOFF BIOTIC INDEX		EII Sub-Index Component	6.76	5.34	5.94
2510	# of Diptera Taxa			4	2	2
2511	# of Ephemeroptera Taxa		EII Sub-Index Component	1	1	1
2512	% of total as Chironomidae		EII Sub-Index Component	70.09	20.64	31.08
2513	% of total as Elmidae			0	0.32	0
2514	# of Noninsect Taxa			5	7	3
2515	# of EPT Taxa		EII Sub-Index Component	1	2	2
2516	% of total as EPT		EII Sub-Index Component	0.96	47.41	36.48
2517	% of total as Collector/Gatherer			7.98	62.58	62.16
2518	% of total as Predator		EII Sub-Index Component	73.15	37.74	32.43
2519	% of total as Filterers			70.63	21.61	35.13
2520	% of total as Grazers (PI and SC)			18.31	2.25	2.7
2521	% of Trichoptera as Hydropsychidae			0	100	100
2522	Ratio or Intolerant to Tolerant Organisms			0.01	0.93	0.54
2523	# of Intolerant Taxa		EII Sub-Index Component	2	2	2
2524	% of total as Tolerant Organisms			20.84	0.64	4.05
2525	% Dominance (top 3 Taxa)		EII Sub-Index Component	94.35	79.67	75.67
2526	% of total as Dominant Guild (FFG)			73.15	62.58	62.16
2759	EPT/EPT+Chironomidae			0.014	0.697	0.54
3159	TCEQ QuantitativeAquatic Life Use Score			17	25	23
3160	TCEQ Qualitative Aquatic Life Use Score			16	17	16

Benthic Macroinvertebrates - Fort Branch Watershed 2006

Param	Lowest Identified Taxon	PTI	FFG	Fort Branch at Glencrest Drive 126 07/10/06	Fort Branch above Manor Rd 125 07/10/06	Fort Branch at Carson Hill 898	Fort Branch at N. Boggy 123
363	HYDROPTILA	2	PI, SC	2	4		
341	CAMELOBAETIDIUS	4	CG		5		
1360	FALLCEON QUILLER	4	CG	4	30		
369	OSTRACODA	4	CG, FC		1		
335	ARGIA	6	P	26	2		
788	CHEUMATOPSYCHE	6	FC	10	5		
789	CHIRONOMIDAE	6	FC, P	32	32		
359	HYDRACARINA (ACARI	6	P	1			
818	LIMONIA	6	SH		1		
381	TANYPODINAE	6	P	2	15		
4276	FERRISSIA	7	SC	2			
378	STENELMIS	7	CG, SC		1		
367	OLIGOCHAETA	8	CG		1		
873	LIBELLULIDAE	9	P	1			
371	PHYSA (PHYSELLA)	9	SC	5	7		
1873	# of Organisms			85	104		
1877	# of Taxon	EII Sub-Index Component		9	11		
1880	% Dominance (top 1 Taxa)			37.64	30.76		
1886	HILSENHOFF BIOTIC INDEX	EII Sub-Index Component		6.04	5.38		
2510	# of Diptera Taxa			1	2	dry	dry
2511	# of Ephemeroptera Taxa	EII Sub-Index Component		1	2		
2512	% of total as Chironomidae	EII Sub-Index Component		40	45.19		
2513	% of total as Elmidae			0	0.96		
2514	# of Noninsect Taxa			3	3		
2515	# of EPT Taxa	EII Sub-Index Component		3	4		
2516	% of total as EPT	EII Sub-Index Component		18.82	42.3		
2517	% of total as Collector/Gatherer			4.7	36.53		
2518	% of total as Predator	EII Sub-Index Component		72.94	47.11		
2519	% of total as Filterers			51.76	50.96		
2520	% of total as Grazers (PI and SC)			10.58	11.53		
2521	% of Trichoptera as Hydropsychidae			83.33	55.55		
2522	Ratio or Intolerant to Tolerant Organisms			0.07	0.62		
2523	# of Intolerant Taxa	EII Sub-Index Component		2	4		
2524	% of total as Tolerant Organisms			7.05	6.73		
2525	% Dominance (top 3 Taxa)	EII Sub-Index Component		80	66.34		
2526	% of total as Dominant Guild (FFG)			72.94	50.96		
2759	EPT/EPT+Chironomidae			0.32	0.484		
3159	TCEQ QuantitativeAquatic Life Use Score			15	25		
3160	TCEQ Qualitative Aquatic Life Use Score			15	23		

Benthic Macroinvertebrates - Harpers Branch Watershed 2006

Param	Lowest Identified Taxon	PTI	FFG	Harpers Branch at Woodland Ave 844 07/12/06
369	OSTRACODA	4	CG, FC	1
779	ANAX	5	P	1
496	ARCHILESTES	6	P	1
335	ARGIA	6	P	5
789	CHIRONOMIDAE	6	FC, P	20
381	TANYPODINAE	6	P	8
4276	FERRISSIA	7	SC	23
367	OLIGOCHAETA	8	CG	15
504	TIPULA	8	CG, SH	1
371	PHYSA (PHYSELLA)	9	SC	10
1873	# of Organisms			85
1877	# of Taxon	EII Sub-Index Component		9
1880	% Dominance (top 1 Taxa)			27.05
1886	HILSENHOFF BIOTIC INDEX	EII Sub-Index Component		6.96
2510	# of Diptera Taxa			2
2511	# of Ephemeroptera Taxa	EII Sub-Index Component		0
2512	% of total as Chironomidae	EII Sub-Index Component		32.94
2513	% of total as Elmidae			0
2514	# of Noninsect Taxa			4
2515	# of EPT Taxa	EII Sub-Index Component		0
2516	% of total as EPT	EII Sub-Index Component		0
2517	% of total as Collector/Gatherer			20
2518	% of total as Predator	EII Sub-Index Component		41.17
2519	% of total as Filterers			34.11
2520	% of total as Grazers (PI and SC)			38.82
2521	% of Trichoptera as Hydropsychidae			0
2522	Ratio or Intolerant to Tolerant Organisms			0.02
2523	# of Intolerant Taxa	EII Sub-Index Component		1
2524	% of total as Tolerant Organisms			11.76
2525	% Dominance (top 3 Taxa)	EII Sub-Index Component		68.23
2526	% of total as Dominant Guild (FFG)			41.17
2759	EPT/EPT+Chironomidae			0
3159	TCEQ QuantitativeAquatic Life Use Score			21
3160	TCEQ Qualitative Aquatic Life Use Score			21

Benthic Macroinvertebrates - Johnson Creek Watershed 2006

Param	Lowest Identified Taxon	PTI	FFG	Johnson Creek at Woodmont Avenue 897 07/07/06
1360	FALLCEON QUILLER]	4	CG	1
789	CHIRONOMIDAE	6	FC, P	3
359	HYDRACARINA (ACARI]	6	P	1
348	CULICIDAE	8	FC	2
357	HIRUDINEA	8	P	2
367	OLIGOCHAETA	8	CG	14
1086	COPELATUS	9	P	1
873	LIBELLULIDAE	9	P	1
371	PHYSA (PHYSELLA]	9	SC	8
1873	# of Organisms			33
1877	# of Taxon	EII Sub-Index Component		9
1880	% Dominance (top 1 Taxa)			42.42
1886	HILSENHOFF BIOTIC INDEX	EII Sub-Index Component		7.93
2510	# of Diptera Taxa			2
2511	# of Ephemeroptera Taxa	EII Sub-Index Component		1
2512	% of total as Chironomidae	EII Sub-Index Component		9.09
2513	% of total as Elmidae			0
2514	# of Noninsect Taxa			4
2515	# of EPT Taxa	EII Sub-Index Component		1
2516	% of total as EPT	EII Sub-Index Component		3.03
2517	% of total as Collector/Gatherer			45.45
2518	% of total as Predator	EII Sub-Index Component		24.24
2519	% of total as Filterers			15.15
2520	% of total as Grazers (PI and SC)			24.24
2521	% of Trichoptera as Hydropsychidae			0
2522	Ratio or Intolerant to Tolerant Organisms			0.03
2523	# of Intolerant Taxa	EII Sub-Index Component		1
2524	% of total as Tolerant Organisms			30.3
2525	% Dominance (top 3 Taxa)	EII Sub-Index Component		75.75
2526	% of total as Dominant Guild (FFG)			45.45
2759	EPT/EPT+Chironomidae			0.25
3159	TCEQ QuantitativeAquatic Life Use Score			23
3160	TCEQ Qualitative Aquatic Life Use Score			20

Benthic Macroinvertebrates - Little Walnut Creek Watershed 2006

Param	Lowest Identified Taxon	PTI	FFG	Little Walnut at Golden Meadow 838 07/10/06	Little Walnut at Georgian Dr 3860 07/10/06	Little Walnut at Cameron Rd 3857 07/11/06	Little Walnut at US183 634 07/06/06
334	CHIMARRA	2	FC		2	19	57
335	HELICOPSYCHE	2	SC				1
338	HYDROPTILA	2	PI, SC	13	10	1	2
339	MICROCYLLOEPUS PUSILLUS	2	CG, SC	1			
340	CAMELOBAETIDIUS	4	CG		71	51	19
341	FALLCEON QUILLER	4	CG	170	72	91	77
343	MACRELMIS	4	CG, SC			1	
346	OSTRACODA	4	CG, FC	2	38	4	1
348	SIMULIUM	4	FC			2	6
351	PETROPHILA (MOTH LARVAE)	5	SC		2	2	
353	TRICORYTHODES	5	CG				1
356	ARGIA	6	P	14	44	2	3
357	BRECHMORHOGA MENDAX	6	P		5	1	1
358	CHEUMATOPSYCHE	6	FC		69	106	58
359	CHIRONOMIDAE	6	FC, P	36	65	90	16
363	HETAERINA	6	P		2	1	
366	TANYPODINAE	6	P	11	17	17	11
367	CALOPARYPHUS	7	CG		1		
369	STENELMIS	7	CG, SC	13	6	1	
371	DUGESIA TIGRINA	7.5	CG, P	38	2		
372	EUPARYPHUS	8	CG, SC	5			
373	OLIGOCHAETA	8	CG				1
1083	PHYSA (PHYSELLA)	9	SC		3	1	1
1873	# of Organisms			303	409	390	255
1877	# of Taxon		EII Sub-Index Component	9	15	15	14
1880	% Dominance (top 1 Taxa)			56.1	17.6	27.17	30.19
1886	HILSENHOFF BIOTIC INDEX		EII Sub-Index Component	4.94	5.03	5.03	4.26
2510	# of Diptera Taxa			2	2	2	2
2511	# of Ephemeroptera Taxa		EII Sub-Index Component	1	2	2	3
2512	% of total as Chironomidae		EII Sub-Index Component	15.51	20.04	27.43	10.58
2513	% of total as Elmidae			4.62	1.46	0.51	0
2514	# of Noninsect Taxa			2	3	2	3
2515	# of EPT Taxa		EII Sub-Index Component	2	5	5	7
2516	% of total as EPT		EII Sub-Index Component	60.39	54.76	68.71	84.31
2517	% of total as Collector/Gatherer			75.57	46.45	37.94	38.82
2518	% of total as Predator		EII Sub-Index Component	32.67	33	28.46	12.15
2519	% of total as Filterers			16.17	46.69	61.02	58.43
2520	% of total as Grazers (PI and SC)			10.56	5.13	1.53	1.56
2521	% of Trichoptera as Hydropsychidae			0	85.18	84.12	49.15
2522	Ratio or Intolerant to Tolerant Organisms			1.58	0.91	0.78	1.8
2523	# of Intolerant Taxa		EII Sub-Index Component	4	5	7	7
2524	% of total as Tolerant Organisms			0	0.73	0.25	0.39
2525	% Dominance (top 3 Taxa)		EII Sub-Index Component	80.52	51.83	73.58	75.29
2526	% of total as Dominant Guild (FFG)			75.57	46.69	61.02	58.43
2759	EPT/EPT+Chironomidae			0.796	0.732	0.715	0.888
3159	TCEQ QuantitativeAquatic Life Use Score			25	29	23	25
3160	TCEQ Qualitative Aquatic Life Use Score			20	25	21	28

Benthic Macroinvertebrates - Shoal Creek Watershed 2006

Param	Lowest Identified Taxon	PTI	FFG	Shoal Creek d/s of Crosscreek Dr 118 07/07/06	Shoal Creek at Shoal Edge Ct 117 07/07/06	Shoal Creek at 24th Street 116 07/07/06	Shoal Creek above 1st St. 122 07/05/06
343	CHIMARRA	2	FC		1	4	
363	HYDROPTILA	2	PI, SC	18			
366	MICROCYLLOEPUS PUSILLUS	2	CG, SC		1		
341	CAMELOBAETIDIUS	4	CG			7	
1470	DOLICHOPODIDAE	4	P				1
1360	FALLCEON QUILLER	4	CG	6	18	116	9
4402	LIMNOPHILA	4	P	4			
369	OSTRACODA	4	CG, FC	5	15	3	2
334	AMBRYSUS	5	P	3			
1744	DASYHELEA	5	CG, SC	1			
1083	HELOCHARES (ADULT)	5	CG	1			
335	ARGIA	6	P	1	26	10	9
339	BRECHMORHOGA MENDAX	6	P		2	2	
788	CHEUMATOPSYCHE	6	FC		40	18	1
789	CHIRONOMIDAE	6	FC, P	52	53	225	254
346	CORBICULA FLUMINEA	6	FC		1		1
801	EPHYDRIDAE	6	P				1
1745	FOSSARIA	6	SC	2			
359	HYDRACARINA (ACARI)	6	P	2	5	5	
818	LIMONIA	6	SH			1	
1531	MUSCIDAE	6	P			1	
376	RHAGOVELIA	6	P			1	
381	TANYPODINAE	6	P	10	12	80	21
1743	BEZZIA (PALPOMYIA)	7	CG, P		1		
340	CAENIS	7	CG, SC			4	
953	CALOPARYPHUS	7	CG	2			
1746	GYRAULUS	7	SC	20			
2391	HELISOMA ANCEPS	7	SC	24		1	
378	STENELMIS	7	CG, SC	1	12	6	
351	DUGESIA TIGRINA	7.5	CG, P	41	2		1
804	EUPARYPHUS	8	CG, SC			1	
357	HIRUDINEA	8	P		2	2	1
358	HYALELLA	8	CG, SH				1
367	OLIGOCHAETA	8	CG			10	6
1532	PELTODYTES	8	P, PI, SH	1			
504	TIPULA	8	CG, SH			1	
338	BEROSUS (LARVAE)	9	CG	1			
1085	ENOCHRUS	9	CG			2	
371	PHYSA (PHYSELLA)	9	SC	12	6	102	
1112	SCIOMYZIDAE	10	P	1			
1873	# of Organisms			208	197	602	308
1877	# of Taxon		EII Sub-Index Component	20	15	21	12
1880	% Dominance (top 1 Taxa)			25	26.9	37.37	82.46
1886	HILSENHOFF BIOTIC INDEX		EII Sub-Index Component	6.22	5.81	6.13	5.97
2510	# of Diptera Taxa			5	2	5	3
2511	# of Ephemeroptera Taxa		EII Sub-Index Component	1	1	3	1
2512	% of total as Chironomidae		EII Sub-Index Component	29.8	32.99	50.66	89.28
2513	% of total as Elmidae			0.48	6.59	0.99	0
2514	# of Noninsect Taxa			7	6	6	6
2515	# of EPT Taxa		EII Sub-Index Component	2	3	5	2
2516	% of total as EPT		EII Sub-Index Component	11.53	29.94	24.75	3.24
2517	% of total as Collector/Gatherer			27.88	24.87	24.91	6.16
2518	% of total as Predator		EII Sub-Index Component	55.28	52.28	54.15	93.5
2519	% of total as Filterers			32.21	61.92	54.81	90.58
2520	% of total as Grazers (PI and SC)			37.5	9.64	18.93	0
2521	% of Trichoptera as Hydropsychidae			0	97.56	81.81	100
2522	Ratio or Intolerant to Tolerant Organisms			0.22	0.21	0.27	0.04
2523	# of Intolerant Taxa		EII Sub-Index Component	4	4	4	3
2524	% of total as Tolerant Organisms			6.73	3.04	17.27	0
2525	% Dominance (top 3 Taxa)		EII Sub-Index Component	56.25	60.4	73.58	88.31
2526	% of total as Dominant Guild (FFG)			55.28	61.92	54.81	93.5
2759	EPT/EPT+Chironomidae			0.279	0.476	0.328	0.035
3159	TCEQ QuantitativeAquatic Life Use Score			25	21	21	15
3160	TCEQ Qualitative Aquatic Life Use Score			21	24	24	16

Benthic Macroinvertebrates - Tannehill Watershed 2006

Param	Lowest Identified Taxon	PTI	FFG	Tannehill at Berkman Drive 3858 07/10/06	Tannehill at Lovell Drive 843 07/10/06	Tannehill at Desirable Drive 1476 07/06/06
343	CHIMARRA	2	FC		26	
806	HELICOPSYCHE	2	SC	1		
363	HYDROPTILA	2	PI, SC	2	7	
341	CAMELOBAETIDIUS	4	CG		37	
1360	FALLCEON QUILLER	4	CG	24	241	
369	OSTRACODA	4	CG, FC	1		
1744	DASYHELEA	5	CG, SC		1	
518	PETROPHILA (MOTH LARVAE)	5	SC		5	
384	TRICORYTHODES	5	CG	1		
335	ARGIA	6	P	18	30	
339	BRECHMORHOGA MENDAX	6	P		7	
788	CHEUMATOPSYCHE	6	FC		62	
789	CHIRONOMIDAE	6	FC, P	117	108	45
359	HYDRACARINA (ACARI)	6	P	1		
1531	MUSCIDAE	6	P			1
1463	PROBEZZIA	6	P			1
376	RHAGOVELIA	6	P		2	
381	TANYPODINAE	6	P	13	45	1
953	CALOPARYPHUS	7	CG			1
351	DUGESIA TIGRINA	7.5	CG, P	1		
357	HIRUDINEA	8	P	1		2
367	OLIGOCHAETA	8	CG		13	6
371	PHYSA (PHYSELLA)	9	SC	12	7	9
1873	# of Organisms			192	591	66
1877	# of Taxon		EII Sub-Index Component	11	13	7
1880	% Dominance (top 1 Taxa)			60.93	40.77	68.18
1886	HILSENHOFF BIOTIC INDEX		EII Sub-Index Component	5.87	4.9	6.66
2510	# of Diptera Taxa			1	2	4
2511	# of Ephemeroptera Taxa		EII Sub-Index Component	2	2	0
2512	% of total as Chironomidae		EII Sub-Index Component	67.7	25.88	69.69
2513	% of total as Elmidae			0	0	0
2514	# of Noninsect Taxa			5	2	3
2515	# of EPT Taxa		EII Sub-Index Component	4	5	0
2516	% of total as EPT		EII Sub-Index Component	14.58	63.11	0
2517	% of total as Collector/Gatherer			14.06	49.4	10.6
2518	% of total as Predator		EII Sub-Index Component	78.64	32.48	75.75
2519	% of total as Filterers			68.22	40.77	69.69
2520	% of total as Grazers (PI and SC)			7.81	3.38	13.63
2521	% of Trichoptera as Hydropsychidae			0	65.26	0
2522	Ratio or Intolerant to Tolerant Organisms			0.17	1.15	0
2523	# of Intolerant Taxa		EII Sub-Index Component	4	4	0
2524	% of total as Tolerant Organisms			6.25	1.18	13.63
2525	% Dominance (top 3 Taxa)		EII Sub-Index Component	82.81	69.54	90.9
2526	% of total as Dominant Guild (FFG)			78.64	49.4	75.75
2759	EPT/EPT+Chironomidae			0.177	0.709	0
3159	TCEQ QuantitativeAquatic Life Use Score			15	23	13
3160	TCEQ Qualitative Aquatic Life Use Score			19	19	16

Benthic Macroinvertebrates - Waller Creek Watershed 2006

Param	Lowest Identified Taxon	PTI	FFG	Waller Creek at 51st Street 780 07/05/06	Waller Creek upstream of 23rd St 624 07/05/06	Waller Creek below Cesar Chavez 38 07/05/06
341	CAMELOBAETIDIUS	4	CG		1	
1360	FALLCEON QUILLER	4	CG	33	7	3
369	OSTRACODA	4	CG, FC	25		35
335	ARGIA	6	P	22	6	4
339	BRECHMORHOGA MENDAX	6	P		1	2
788	CHEUMATOPSYCHE	6	FC		5	3
789	CHIRONOMIDAE	6	FC, P	10	22	208
359	HYDRACARINA (ACARI)	6	P	2		
1531	MUSCIDAE	6	P			1
381	TANYPODINAE	6	P	12	11	38
351	DUGESIA TIGRINA	7.5	CG, P	2		
357	HIRUDINEA	8	P	4		
358	HYALELLA	8	CG, SH			7
367	OLIGOCHAETA	8	CG	11		
504	TIPULA	8	CG, SH			2
371	PHYSA (PHYSELLA)	9	SC			2
1873	# of Organisms			121	53	305
1877	# of Taxon	EII Sub-Index Component		8	6	10
1880	% Dominance (top 1 Taxa)			27.27	41.5	68.19
1886	HILSENHOFF BIOTIC INDEX	EII Sub-Index Component		5.31	5.69	5.82
2510	# of Diptera Taxa			1	1	3
2511	# of Ephemeroptera Taxa	EII Sub-Index Component		1	2	1
2512	% of total as Chironomidae	EII Sub-Index Component		18.18	62.26	80.65
2513	% of total as Elmidae			0	0	0
2514	# of Noninsect Taxa			5	0	3
2515	# of EPT Taxa	EII Sub-Index Component		1	3	2
2516	% of total as EPT	EII Sub-Index Component		27.27	24.52	1.96
2517	% of total as Collector/Gatherer			58.67	15.09	15.4
2518	% of total as Predator	EII Sub-Index Component		42.97	75.47	82.95
2519	% of total as Filterers			38.84	71.69	93.11
2520	% of total as Grazers (PI and SC)			0	0	0.65
2521	% of Trichoptera as Hydropsychidae			0	100	100
2522	Ratio or Intolerant to Tolerant Organisms			0.92	0.17	0.14
2523	# of Intolerant Taxa	EII Sub-Index Component		2	2	2
2524	% of total as Tolerant Organisms			0	0	0.65
2525	% Dominance (top 3 Taxa)	EII Sub-Index Component		66.11	66.03	81.96
2526	% of total as Dominant Guild (FFG)			58.67	75.47	93.11
2759	EPT/EPT+Chironomidae			0.6	0.283	0.024
3159	TCEQ QuantitativeAquatic Life Use Score			23	17	19
3160	TCEQ Qualitative Aquatic Life Use Score			17	15	17

Benthic Macroinvertebrates - Walnut Creek Watershed 2006

Para	Lowest Identified Taxon	PTI	FFG	Walnut Wells Branch at Walnut Metro 463 07/10/06	Walnut at Metric Blvd 895 06/13/06	Walnut below IH 35 464 06/13/06	Walnut at Old Manor Rd 502 06/14/06	Walnut above SPRR Bridge 503 06/14/06
1521	MARILIA	0	SH	2	5			
343	CHIMARRA	2	FC	4	87	22	216	105
806	HELICOPSYCHE	2	SC		13	2	1	10
356	HEXACYLLOEPUS FERRUGINEUS	2	CG, SC					1
366	MICROCYLLOEPUS PUSILLUS	2	CG, SC	60	17	6	20	4
821	NEOELMIS CAESA	2	CG, SC		1	4	29	4
382	THRAULODES GONZALES	2	CG, SC			1	7	3
341	CAMELOBAETIDIUS	4	CG	3	6	38	2	27
1360	FALLCEON QUILLER	4	CG	8	71	56	39	118
920	MACRELMIS	4	CG, SC	24	8	19	34	1
1760	METRICHIA	4			3			
369	OSTRACODA	4	CG, FC	2	4			
508	PSEPHENUS	4	SC	1	32	6		
377	SIMULIUM	4	FC	1	18	5	2	3
1744	DASYHELEA	5	CG, SC		2			
819	LUTROCHUS LUTEUS	5	CG				1	
1089	OECETIS	5	P, SH	3	5	2		3
518	PETROPHILA (MOTH LARVAE)	5	SC			1		6
384	TRICORYTHODES	5	CG	3				
335	ARGIA	6	P	58	52	21	6	1
1458	ATRICHOPOGON	6	P		1			
339	BRECHMORHOGA MENDAX	6	P	3	46	8	14	8
788	CHEUMATOPSYCHE	6	FC	35	280	85	164	593
789	CHIRONOMIDAE	6	FC, P	98	28	22	18	19
799	DIPTERA (MIDGE/FLY LARVAE)	6	CG, FC, P, SC, SH	1				
808	HEMERODROMIA	6	CG, P			1		
507	HETAERINA	6	P	1	5	2	1	
359	HYDRACARINA (ACARI)	6	P	1			1	
818	LIMONIA	6	SH		1			
376	RHAGOVELIA	6	P	6	19	1	2	2
381	TANYPODINAE	6	P	11	41	26		2
340	CAENIS	7	CG, SC		5			
4276	FERRISSIA	7	SC		1			
1746	GYRAULUS	7	SC		1			
2391	HELISOMA ANCEPS	7	SC	1				
378	STENELMIS	7	CG, SC	2	3	1		
351	DUGESIA TIGRINA	7.5	CG, P	27	23	28	10	9
353	EMPIDIDAE	8	CG, P				1	
358	HYALELLA	8	CG, SH		1	1		
367	OLIGOCHAETA	8	CG	1				2
504	TIPULA	8	CG, SH				1	
371	PHYSA (PHYSELLA)	9	SC		1			
5143	CINCINNATIA	no PTI	SC		2			
1873	# of Organisms			356	782	358	569	921
1877	# of Taxon		EII Sub-Index Component	23	30	22	20	19
1880	% Dominance (top 1 Taxa)			27.52	19.56	15.36	18.8	32.35
1886	HILSENHOFF BIOTIC INDEX		EII Sub-Index Component	5.13	5.04	5.03	3.84	5.13
2510	# of Diptera Taxa			3	5	3	4	2
2511	# of Ephemeroptera Taxa		EII Sub-Index Component	3	3	3	3	3
2512	% of total as Chironomidae		EII Sub-Index Component	30.61	8.82	13.4	3.16	2.28
2513	% of total as Elmidae			24.15	3.7	8.37	14.58	1.08
2514	# of Noninsect Taxa			5	7	2	2	2
2515	# of EPT Taxa		EII Sub-Index Component	7	9	7	6	7
2516	% of total as EPT		EII Sub-Index Component	16.29	60.74	57.54	75.39	93.26
2517	% of total as Collector/Gatherer			36.79	18.03	43.29	25.3	18.34
2518	% of total as Predator		EII Sub-Index Component	58.7	28.13	31	9.31	4.77
2519	% of total as Filterers			42.69	58.56	44.69	70.29	78.39
2520	% of total as Grazers (PI and SC)			25	10.74	11.17	15.99	3.14
2521	% of Trichoptera as Hydropsychidae			79.54	71.24	76.57	43.04	83.4
2522	Ratio or Intolerant to Tolerant Organisms			0.45	0.53	0.82	1.61	0.44
2523	# of Intolerant Taxa		EII Sub-Index Component	9	12	10	9	10
2524	% of total as Tolerant Organisms			0	0.12	0	0	0
2525	% Dominance (top 3 Taxa)		EII Sub-Index Component	60.67	31.2	28.49	38.31	45.6
2526	% of total as Dominant Guild (FFG)			58.7	58.56	44.69	70.29	78.39
2759	EPT/EPT+Chironomidae			0.347	0.873	0.811	0.96	0.976
3159	TCEQ QuantitativeAquatic Life Use Score			29	33	33	37	33
3160	TCEQ Qualitative Aquatic Life Use Score			24	34	29	33	31

Benthic Macroinvertebrates - West Bouldin Creek Watershed 2006

Param	Lowest Identified Taxon	PTI	FFG	West Bouldin at Cardinal 3856 07/05/06	West Bouldin at Oltorf Street 3854 07/11/06	West Bouldin at Post Oak 2794
806	HELICOPSYCHE	2	SC		3	
363	HYDROPTILA	2	PI, SC		2	
341	CAMELOBAETIDIUS	4	CG		22	
1470	DOLICHOPODIDAE	4	P		5	
1360	FALLCEON QUILLER	4	CG		124	
369	OSTRACODA	4	CG, FC	1		
1744	DASYHELEA	5	CG, SC		1	
871	HYDROPHILIDAE	5	CG, P	1		
518	PETROPHILA (MOTH LARVAE)	5	SC		6	
335	ARGIA	6	P	1	25	
788	CHEUMATOPSYCHE	6	FC		30	
789	CHIRONOMIDAE	6	FC, P	5	25	
1745	FOSSARIA	6	SC	8		
359	HYDRACARINA (ACARI)	6	P	1		
381	TANYPODINAE	6	P	1	20	
953	CALOPARYPHUS	7	CG	2	2	
523	HYDROCHUS	7	SH	1		
351	DUGESIA TIGRINA	7.5	CG, P		27	
807	HELOPHORUS	7.9	SH	1		
357	HIRUDINEA	8	P	7		
1763	LACCOBIUS	8		1		
367	OLIGOCHAETA	8	CG	4	1	
504	TIPULA	8	CG, SH	1		
371	PHYSA (PHYSELLA)	9	SC	330	2	
1753	PROCAMBARUS	9	CG	1		
1201	CULEX	10	FC	1		dry
509	LACCOPHILUS	10	P	21	2	
1873	# of Organisms			388	297	
1877	# of Taxon	EII Sub-Index Component		17	15	
1880	% Dominance (top 1 Taxa)			85.05	41.75	
1886	HILSENHOFF BIOTIC INDEX	EII Sub-Index Component		8.85	5.08	
2510	# of Diptera Taxa			4	4	
2511	# of Ephemeroptera Taxa	EII Sub-Index Component		0	2	
2512	% of total as Chironomidae	EII Sub-Index Component		1.54	15.15	
2513	% of total as Elmidae			0	0	
2514	# of Noninsect Taxa			7	3	
2515	# of EPT Taxa	EII Sub-Index Component		0	5	
2516	% of total as EPT	EII Sub-Index Component		0	60.94	
2517	% of total as Collector/Gatherer			2.57	59.59	
2518	% of total as Predator	EII Sub-Index Component		9.53	35.01	
2519	% of total as Filterers			2.06	25.25	
2520	% of total as Grazers (PI and SC)			87.11	4.71	
2521	% of Trichoptera as Hydropsychidae			0	85.71	
2522	Ratio or Intolerant to Tolerant Organisms			0	1.21	
2523	# of Intolerant Taxa	EII Sub-Index Component		1	5	
2524	% of total as Tolerant Organisms			90.97	1.34	
2525	% Dominance (top 3 Taxa)	EII Sub-Index Component		92.52	60.94	
2526	% of total as Dominant Guild (FFG)			87.11	59.59	
2759	EPT/EPT+Chironomidae			0	0.801	
3159	TCEQ QuantitativeAquatic Life Use Score			17	27	
3160	TCEQ Qualitative Aquatic Life Use Score			23	19	

Benthic Macroinvertebrates - Williamson Creek Watershed 2006

Param	Lowest Identified Taxon	PTI	FFG	Williamson at Hwy 71 490 07/07/06	Williamson at IH35 491 07/11/06	Williamson at McKinney Falls 223 07/06/06
806	HELICOPSYCHE	2	SC			4
363	HYDROPTILA	2	PI, SC			9
1755	CALLIBAETIS	4	CG		8	1
1360	FALLCEON QUILLER	4	CG			1
369	OSTRACODA	4	CG, FC		1	2
2410	CINCINNATIA CINCINNATIENSIS	5	SC			4
1758	CURICTA	5	P		1	
817	LIMNOPOROUS	5	P		3	
518	PETROPHILA (MOTH LARVAE)	5	SC			1
384	TRICORYTHODES	5	CG			2
335	ARGIA	6	P		2	10
788	CHEUMATOPSYCHE	6	FC			1
789	CHIRONOMIDAE	6	FC, P		38	11
1745	FOSSARIA	6	SC	4		
507	HETAERINA	6	P			3
359	HYDRACARINA (ACARI)	6	P		1	2
1748	PLANORBELLA	6	SC		2	
372	PLANORBIDAE	6	SC	13		
1463	PROBEZZIA	6	P			1
376	RHAGOVELIA	6	P			10
381	TANYPODINAE	6	P			7
1746	GYRAULUS	7	SC			2
2391	HELISOMA ANCEPS	7	SC		1	
351	DUGESIA TIGRINA	7.5	CG, P			4
348	CULICIDAE	8	FC	266		
357	HIRUDINEA	8	P		1	
358	HYALELLA	8	CG, SH		1	48
497	LIBELLULA	8	P		5	
367	OLIGOCHAETA	8	CG	1		
1532	PELTODYTES	8	P, PI, SH			1
338	BEROSUS (LARVAE)	9	CG			3
1090	ISCHNURA	9	P		2	
371	PHYSA (PHYSELLA)	9	SC	288	62	1
509	LACCOPHILUS	10	P	16		
1873	# of Organisms			588	128	128
1877	# of Taxon		EII Sub-Index Component	6	14	21
1880	% Dominance (top 1 Taxa)			48.97	48.43	37.5
1886	HILSENHOFF BIOTIC INDEX		EII Sub-Index Component	8.48	7.44	6.39
2510	# of Diptera Taxa			1	1	2
2511	# of Ephemeroptera Taxa		EII Sub-Index Component	0	1	3
2512	% of total as Chironomidae		EII Sub-Index Component	0	29.68	14.06
2513	% of total as Elmidae			0	0	0
2514	# of Noninsect Taxa			4	7	7
2515	# of EPT Taxa		EII Sub-Index Component	0	1	6
2516	% of total as EPT		EII Sub-Index Component	0	6.25	14.06
2517	% of total as Collector/Gatherer			0.17	7.81	47.65
2518	% of total as Predator		EII Sub-Index Component	2.72	41.4	38.28
2519	% of total as Filterers			45.23	30.46	16.4
2520	% of total as Grazers (PI and SC)			51.87	50.78	16.4
2521	% of Trichoptera as Hydropsychidae			0	0	7.14
2522	Ratio or Intolerant to Tolerant Organisms			0	0.11	0.23
2523	# of Intolerant Taxa		EII Sub-Index Component	0	2	5
2524	% of total as Tolerant Organisms			51.7	50	3.12
2525	% Dominance (top 3 Taxa)		EII Sub-Index Component	96.93	84.37	53.9
2526	% of total as Dominant Guild (FFG)			51.87	50.78	47.65
2759	EPT/EPT+Chironomidae			0	0.174	0.5
3159	TCEQ QuantitativeAquatic Life Use Score			19	17	29
3160	TCEQ Qualitative Aquatic Life Use Score			15	17	24

Appendix B:

Diatom Data* by Site
2006 EII Phase 1

* Species lists for each site are arranged in descending order from least tolerant to most tolerant. Color coding has been added to facilitate visual review in the following manner:

Tolerance Values >3 (intolerant)

Tolerance Values 2-3

Tolerance Values <2 (tolerant)

Diatoms - Barton Creek Watershed 2006

Param	Lowest Identified Taxon	PTI	Barton at Hwy 71 below Little Barton 48 7/7/06	Barton at Hwy 71 below Little Barton 48 7/7/06 Field Replica	Barton Ogletree Pool 49 7/11/06	Barton downstream of Lost Creek Blvd 51 7/7/06	Barton above Pool 879
4333	ADLAFIA BRYOPHILA	4	16	2	4	1	
580	AMPHORA INARIENSIS	4				1	
4864	BRACHYSIRA NEOEXILIS (SERIANS	4	5	1	3		
604	CYMBELLA CYMBIFORMIS	4	2				
1418	DIPLONEIS OVALIS	4		1			
605	ENCYONEMA DELICATULA	4	36	60	60	2	
567	EUCOCCONEIS FLEXELLA	4			1		
642	FRAGILARIA ACUS	4	4	5	6		
643	PSEUDOSTAUROSIRA BREVISTRIATA	4				4	
1251	SYNEDRA NANA	4	5				
565	ACHNANTHES BIASOLETTIANA	3	34	211	40	8	
566	ACHNANTHES EXIGUA	3				2	
2040	ACHNANTHIDIUM MINUTISSIMUM	3	130	8	22	80	
575	AMPHIPLEURA PELLUCIDA	3	15	4		3	
579	AMPHORA OVALIS	3			2	1	
581	AMPHORA PEDICULUS	3				50	
584	BRACHYSIRA VITREA	3	24	5	14	13	
593	COCCONEIS PEDICULUS	3				3	
594	COCCONEIS PLACENTULA	3			1	38	
603	CYMBELLA CISTULA	3	2		12		
608	CYMBELLA LAEVIS	3		4			
618	DENTICULA KUETZINGI	3	2	2		16	
628	DIPLONEIS PUELLA	3	1				
2047	ENCYONEMA EVERGLADIANUM	3	65	36	187	34	
611	ENCYONEMA SILESIACUM	3	3	2	2	1	
609	ENCYONOPSIS MICROCEPHALA	3	55	19	42	21	
1250	EUNOTIA PECTINALIS	3		2			
644	FRAGILARIA CAPUCINA	3				20	
656	GOMPHONEMA AFFINE	3		2			
657	GOMPHONEMA ANGUSTUM	3			2		
663	GOMPHONEMA GRACILE	3			1		
3872	GOMPHONEMA PUMILUM	3	2				
688	NAVICULA CRYPTOCEPHALA	3	4		6	4	
1382	NAVICULA CRYPTOTENELLA	3	14	1		4	
717	NAVICULA KOTSCHYI	3				2	
707	NAVICULA RADIOSA	3	4	9	2	12	dry
709	NAVICULA RHYNCHOCEPHALA	3				4	
712	NAVICULA STROEMII	3	6	14	4		
730	NITZSCHIA DISSIPATA	3				4	
733	NITZSCHIA LINEARIS	3	2				
739	PINNULARIA GIBBA	3	2				
747	RHOICOSPHENIA CURVATA	3				2	
748	RHOPALODIA GIBBA	3		2			
649	STAUROSIRA CONSTRUENS	3				12	
1168	BACILLARIA PARADOXA	2				3	
974	MASTOGLOIA ELLIPTICA	2	12	40	13		
1471	MELOSIRA VARIANS	2				4	
1384	NAVICULA ERIFUGA	2		6			
693	NAVICULA LIBONENSIS	2	2				
980	NAVICULA SCHROETERII	2			2		
718	NAVICULA VENETA	2	2				
726	NITZSCHIA AMPHIBIA	2			2	28	
988	NITZSCHIA AMPHIBIOIDES	2	2	2	7	10	
991	NITZSCHIA INCONSPICUA	2				1	
1256	NITZSCHIA SERPENTIRAPHE	2	2	3	4		
704	SELLAPHORA PUPULA	2	1				
758	SYNEDRA ULNA	2	26	52	59	82	
729	TRYBLIONELLA APICULATA	2	2				
697	NAVICULA MINIMA	1	4	1		3	
735	NITZSCHIA PALEA	1	4	1		3	
4507	CYMBELLA HUSDTEDTII V STIGMATA	*		2			
5022	FRAGILARIA CONSTRUENS V. VENTER	*				18	
5073	GOMPHONEMA MCLAUGHLINI	*			2		
5071	NAVICULA ANTONII	*				6	
5034	NAVICULA LEPTOSTRIATA	*	10	3			
1873	number of organisms		500	500	500	500	
1877	number of taxon		34	29	26	36	
3019	Pollution Tolerance Index		3.006	2.923	2.974	2.723	
3020	CYMBELLA richness		6	6	5	4	
3021	% Motile Taxa		13	7.8	6.2	16.4	
3059	% similarity to ref. condition		62.371	47.029	57.057	51.543	

Diatoms - Blunn Creek Watershed 2006

Parameter	Lowest Identified Taxon	PTI	Blunn at Long Bow 362 7/11/06	Blunn above Big Stacy Pool 364 7/5/06	Blunn at Riverside Dr 180 7/11/06
580	AMPHORA INARIENSIS	4		6	1
3200	CYMBELLA PROSTRATA	4	5		
4981	CYMBELLA TURGIDULA	4	2		
625	DIPLONEIS OBLONGELLA	4	7		
642	FRAGILARIA ACUS	4			2
4327	GOMPHONEMA BRASILIENSE	4			26
565	ACHNANTHES BIASOLETTIANA	3		1	
2040	ACHNANTHIDIUM MINUTISSIMUM	3		79	
577	AMPHORA MONTANA	3		2	
579	AMPHORA OVALIS	3	95	2	14
581	AMPHORA PEDICULUS	3	6	30	4
586	CALONEIS ALPESTRIS	3			1
587	CALONEIS BACILLUM	3	44	8	16
592	CALONEIS SILICULA	3		2	14
594	COCCONEIS PLACENTULA	3	34	36	14
608	CYMBELLA LAEVIS	3		2	
618	DENTICULA KUETZINGI	3	2	2	113
628	DIPLONEIS PUELLA	3	18	14	
611	ENCYONEMA SILESIACUM	3		24	
1429	EUNOTIA BILUNARIS	3	1		
656	GOMPHONEMA AFFINE	3	50	6	23
660	GOMPHONEMA CLAVATUM	3	2		6
663	GOMPHONEMA GRACILE	3	2		2
970	GOMPHONEMA GROVEI VAR. LINGULATUM	3	1		5
3872	GOMPHONEMA PUMILUM	3	18		
670	GOMPHONEMA TRUNCATUM	3			1
671	GYROSIGMA NODIFERUM	3	35	1	9
687	NAVICULA CAPITATA VAR. HUNGARICA	3		2	
688	NAVICULA CRYPTOCEPHALA	3		1	
717	NAVICULA KOTSCHYI	3	7	9	6
712	NAVICULA STROEMII	3		2	
733	NITZSCHIA LINEARIS	3		2	1
4335	NITZSCHIA SINUATA VAR DELOGNE	3	2		
992	NITZSCHIA SINUATA VAR. TABELLARIA	3			3
739	PINNULARIA GIBBA	3	35		1
742	PINNULARIA MICROSTAURON	3	1		
745	PINNULARIA VIRIDIS	3	4		
2053	PLACONEIS PLACENTULA	3	1		1
746	REIMERIA SINUATA	3	28		5
747	RHOICOSPHENIA CURVATA	3	10		40
568	ACHNANTHES LANCEOLATA	2		38	
1168	BACILLARIA PARADOXA	2	3		
595	CYCLOTELLA MENEGHINIANA	2		20	
686	DIADESMIS CONFERVACEA	2			1
3179	GOMPHONEMA MEXICANUM	2	2	2	4
1385	LUTICOLA GOEPPERTIANA	2	2		2
699	LUTICOLA MUTICA	2	1		
1384	NAVICULA ERIFUGA	2			1
693	NAVICULA LIBONENSIS	2		2	
696	NAVICULA MENISCULUS	2		1	
1472	NAVICULA SANCTAECRUCIS	2		3	10
980	NAVICULA SCHROETERII	2		22	
714	NAVICULA SUBMINISCULA	2		1	
718	NAVICULA VENETA	2		8	
986	NAVICULA VIRIDULA	2		2	
726	NITZSCHIA AMPHIBIA	2	20	18	122
732	NITZSCHIA FRUSTULUM	2		1	
991	NITZSCHIA INCONSPICUA	2		4	
692	SELLAPHORA LAEVISSIMA	2		1	4
704	SELLAPHORA PUPULA	2		1	
752	SURIRELLA ANGUSTA	2		2	
758	SYNEDRA ULNA	2	50	10	8
729	TRYBLIONELLA APICULATA	2	1		
728	TRYBLIONELLA CALIDA	2		3	
1433	TRYBLIONELLA LEVIDENSIS	2	1		
667	GOMPHONEMA PARVULUM	1	4	32	
697	NAVICULA MINIMA	1		70	
735	NITZSCHIA PALEA	1		4	
4507	CYMBELLA HUSDTEDTII V STIGMATA	*	4		32
4866	CYMBELLA TUMIDA	*			8
5071	NAVICULA ANTONII	*		12	
5034	NAVICULA LEPTOSTRIATA	*		4	
4469	NAVICULA SAVANNIANA	*		8	
998	TERPSINOE MUSICA	*	2		
1873	number of organisms		500	500	500
1877	number of taxon		35	44	33
3019	Pollution Tolerance Index		2.85	2.275	2.733
3020	CYMBELLA richness		4	2	3
3021	% Motile Taxa		6.8	35.8	30
3059	% similarity to ref. condition		17.657	35.571	12.343

Diatoms - Boggy Creek (North) Watershed 2006

Parameter	Lowest Identified Taxon	PTI	Boggy (North) at Manor Rd 2754 7/10/06	Boggy (North) at Nile Street 837 7/6/06	Boggy (North) at Delwau Lane 493 7/6/06
580	AMPHORA INARIENSIS	4	11	3	2
4981	CYMBELLA TURGIDULA	4			2
567	EUCOCCONEIS FLEXELLA	4		6	
1134	PINNULARIA ACROSPHAERIA	4		3	
565	ACHNANTHES BIASOLETTIANA	3	2		
566	ACHNANTHES EXIGUA	3	14	53	76
2040	ACHNANTHIDIUM MINUTISSIMUM	3	6		
577	AMPHORA MONTANA	3	4	10	12
579	AMPHORA OVALIS	3	5		
581	AMPHORA PEDICULUS	3	61	6	
587	CALONEIS BACILLUM	3	1	2	12
592	CALONEIS SILICULA	3		2	4
618	DENTICULA KUETZINGI	3	4	106	2
2047	ENCYONEMA EVERGLADIANUM	3	2		
611	ENCYONEMA SILESIACUM	3		17	5
656	GOMPHONEMA AFFINE	3	2	8	
663	GOMPHONEMA GRACILE	3	1		
970	GOMPHONEMA GROVEI VAR. LINGULATUM	3	1		
670	GOMPHONEMA TRUNCATUM	3		2	
688	NAVICULA CRYPTOCEPHALA	3	1		1
1382	NAVICULA CRYPTOTENELLA	3			2
1383	NAVICULA DECUSSIS	3	4		
717	NAVICULA KOTSCHYI	3	1	10	
712	NAVICULA STROEMII	3	6		
730	NITZSCHIA DISSIPATA	3	2		
733	NITZSCHIA LINEARIS	3			3
739	PINNULARIA GIBBA	3	2		1
746	REIMERIA SINUATA	3	3		
747	RHOICOSPHENIA CURVATA	3	2		
568	ACHNANTHES LANCEOLATA	2	2	3	
1168	BACILLARIA PARADOXA	2			1
595	CYCLOTELLA MENEGHINIANA	2		9	2
686	DIADESMIS CONFERVACEA	2	1	14	
1389	FALLACIA MONOCULATA	2	3	10	
658	GOMPHONEMA ANGUSTATUM	2	6		
3179	GOMPHONEMA MEXICANUM	2	2	3	
1385	LUTICOLA GOEPPERTIANA	2		1	
1471	MELOSIRA VARIANS	2	4	1	
1384	NAVICULA ERIFUGA	2		4	18
1386	NAVICULA INGENUA	2	62		
980	NAVICULA SCHROETERII	2			2
714	NAVICULA SUBMINISCULA	2	1		2
718	NAVICULA VENETA	2	3	2	14
986	NAVICULA VIRIDULA	2	2	34	42
726	NITZSCHIA AMPHIBIA	2	48	33	14
1253	NITZSCHIA CLAUSII	2	1		5
989	NITZSCHIA FILIFORMIS	2	3		4
732	NITZSCHIA FRUSTULUM	2	1	23	9
991	NITZSCHIA INCONSPICUA	2	2	2	96
734	NITZSCHIA MICROCEPHALA	2	1		
1163	NITZSCHIA SIGMA	2	1		
704	SELLAPHORA PUPULA	2		7	2
752	SURIRELLA ANGUSTA	2	2	1	
758	SYNEDRA ULNA	2		2	16
999	THALASSIOSIRA WEISSFLOGII	2	1		27
729	TRYBLIONELLA APICULATA	2	1		
728	TRYBLIONELLA CALIDA	2	1		2
1433	TRYBLIONELLA LEVIDENSIS	2	2	2	
667	GOMPHONEMA PARVULUM	1	4	29	4
697	NAVICULA MINIMA	1	166	81	47
735	NITZSCHIA PALEA	1	8	2	9
737	NITZSCHIA SOLITA	1	1		
711	SELLAPHORA SEMINULUM	1	31		3
4507	CYMBELLA HUSDTEDTII V STIGMATA	*		1	50
5073	GOMPHONEMA MCLAUGHLINII	*	2		
5071	NAVICULA ANTONII	*	2		
5034	NAVICULA LEPTOSTRIATA	*		4	4
4469	NAVICULA SAVANNIANA	*		4	
5070	NITZSCHIA OBTUSA	*			5
5072	NITZSCHIA SILIQUA	*	1		
1873	number of organisms		500	500	500
1877	number of taxon		51	36	35
3019	Pollution Tolerance Index		1.871	2.261	2.143
3020	CYMBELLA richness		2	2	3
3021	% Motile Taxa		71	44	56
3059	% similarity to ref. condition		20.086	16.914	17.657

Diatoms -Buttermilk Creek Watershed 2006

Param	Lowest Identified Taxon	PTI	Buttermilk Creek at Victory Christian Center 3861 7/5/06	Buttermilk at Providence Ave 782 7/5/06	Buttermilk at Little Walnut Creek 851 7/10/06
4327	GOMPHONEMA BRASILIENSE	4	2		
4336	PINNULARIA INTERRUPTA	4	1		
4335	NITZSCHIA SINUATA VAR DELOGNE	3		2	1
2047	ENCYONEMA EVERGLADIANUM	3			1
581	AMPHORA PEDICULUS	3	4		2
611	ENCYONEMA SILESIACUM	3		1	2
579	AMPHORA OVALIS	3			2
565	ACHNANTHES BIASOLETTIANA	3			3
577	AMPHORA MONTANA	3		1	6
730	NITZSCHIA DISSIPATA	3			6
644	FRAGILARIA CAPUCINA	3			7
566	ACHNANTHES EXIGUA	3	42	12	8
717	NAVICULA KOTSCHYI	3	9	4	13
712	NAVICULA STROEMII	3			14
618	DENTICULA KUETZINGII	3	38	6	30
746	REIMERIA SINUATA	3			38
2040	ACHNANTHIDIUM MINUTISSIMUM	3	163	64	231
656	GOMPHONEMA AFFINE	3	6	2	
628	DIPLONEIS PUELLA	3	4	1	
1429	EUNOTIA BILUNARIS	3	1		
587	CALONEIS BACILLUM	3		2	
594	COCCONEIS PLACENTULA	3		2	
660	GOMPHONEMA CLAVATUM	3		2	
709	NAVICULA RHYNCHOCEPHALA	3		2	
688	NAVICULA CRYPTOCEPHALA	3		4	
718	NAVICULA VENETA	2			2
726	NITZSCHIA AMPHIBIA	2	10	66	4
758	SYNEDRA ULNA	2	6		4
595	CYCLOTELLA MENEGHINIANA	2		8	4
568	ACHNANTHES LANCEOLATA	2	42	2	6
714	NAVICULA SUBMINISCULA	2	9	2	7
686	DIADESMIS CONFERVACEA	2	8	9	
1386	NAVICULA INGENUA	2	6		
704	SELLAPHORA PUPULA	2	2		
991	NITZSCHIA INCONSPICUA	2		2	
3179	GOMPHONEMA MEXICANUM	2		2	
732	NITZSCHIA FRUSTULUM	2		3	
694	NAVICULA TRIVIALIS	2		8	
735	NITZSCHIA PALEA	1		22	2
667	GOMPHONEMA PARVULUM	1	24	80	14
697	NAVICULA MINIMA	1	119	42	67
711	SELLAPHORA SEMINULUM	1	2	1	
5034	NAVICULA LEPTOSTRIATA	*			2
4469	NAVICULA SAVANNIANA	*		2	10
4507	CYMBELLA HUSDTEDTII V STIGMATA	*		144	14
5073	GOMPHONEMA MCLAUGHLINII	*	2		
5071	NAVICULA ANTONII	*		2	
1873	number of organisms		500	500	500
1877	number of taxon		21	30	27
3019	Pollution Tolerance Index		2.257	1.886	2.593
3020	CYMBELLA richness		0	2	4
3021	% Motile Taxa		33	34.2	25.2
3059	% similarity to ref. condition		23.457	25.086	30.543

Diatoms - Country Club Creek Watershed 2006

Parameter	Lowest Identified Taxon	PTI	Country Club (West) at East Oltorf St 850 7/6/06	Country Club (East) at Krieg Fields 1474	Country Club (West) at ACC 1475
580	AMPHORA INARIENSIS	4	16	dry	dry
566	ACHNANTHES EXIGUA	3	4		
2040	ACHNANTHIDIUM MINUTISSIMUM	3	6		
581	AMPHORA PEDICULUS	3	93		
587	CALONEIS BACILLUM	3	4		
618	DENTICULA KUETZINGI	3	4		
611	ENCYONEMA SILESIACUM	3	12		
717	NAVICULA KOTSCHYI	3	2		
733	NITZSCHIA LINEARIS	3	1		
747	RHOICOSPHENIA CURVATA	3	2		
595	CYCLOTELLA MENEGHINIANA	2	15		
686	DIADESMIS CONFERVACEA	2	12		
3179	GOMPHONEMA MEXICANUM	2	6		
1384	NAVICULA ERIFUGA	2	2		
1386	NAVICULA INGENUA	2	11		
714	NAVICULA SUBMINISCULA	2	4		
694	NAVICULA TRIVIALIS	2	2		
986	NAVICULA VIRIDULA	2	12		
726	NITZSCHIA AMPHIBIA	2	65		
991	NITZSCHIA INCONSPICUA	2	79		
704	SELLAPHORA PUPULA	2	5		
729	TRYBLIONELLA APICULATA	2	1		
667	GOMPHONEMA PARVULUM	1	18		
697	NAVICULA MINIMA	1	92		
737	NITZSCHIA SOLITA	1	4		
711	SELLAPHORA SEMINULUM	1	8		
4507	CYMBELLA HUSDTEDTII V STIGMATA	*	20		
1873	number of organisms		500		
1877	number of taxon		27		
3019	Pollution Tolerance Index		2.079		
3020	CYMBELLA richness		2		
3021	% Motile Taxa		60		
3059	% similarity to ref. condition		17.057		

Diatoms - East Bouldin Creek Watershed 2006

Param	Lowest Identified Taxon	PTI	East Bouldin d/s of W. Alpine 121 7/5/06	East Bouldin at Elizabeth St 119 7/5/06	East Bouldin at Post Oak 1338 7/6/06	East Bouldin at Post Oak 1338 7/6/06 Field Rep
580	AMPHORA INARIENSIS	4		17	17	52
720	NEIDIUM AMPLIATUM	4			2	
1134	PINNULARIA ACROSPHAERIA	4				2
566	ACHNANTHES EXIGUA	3	5		22	8
2040	ACHNANTHIDIUM MINUTISSIMUM	3		32	60	54
575	AMPHIPLEURA PELLUCIDA	3	6			
577	AMPHORA MONTANA	3			6	2
579	AMPHORA OVALIS	3			2	
581	AMPHORA PEDICULUS	3		45	30	50
587	CALONEIS BACILLUM	3			6	
592	CALONEIS SILICULA	3				2
594	COCCONEIS PLACENTULA	3		90	27	14
618	DENTICULA KUETZINGI	3		16	6	6
1170	DENTICULA SUBTILIS	3				4
611	ENCYONEMA SILESIACUM	3		1	1	
644	FRAGILARIA CAPUCINA	3			2	
656	GOMPHONEMA AFFINE	3	2	2	3	
660	GOMPHONEMA CLAVATUM	3			4	
663	GOMPHONEMA GRACILE	3			2	
970	GOMPHONEMA GROVEI VAR. LINGULATUM	3			1	
3872	GOMPHONEMA PUMILUM	3			5	1
670	GOMPHONEMA TRUNCATUM	3			1	
688	NAVICULA CRYPTOCEPHALA	3	2			7
717	NAVICULA KOTSCHYI	3		1	3	2
707	NAVICULA RADIOSA	3			2	
733	NITZSCHIA LINEARIS	3			2	
4335	NITZSCHIA SINUATA VAR DELOGNE	3			4	
739	PINNULARIA GIBBA	3			2	
746	REIMERIA SINUATA	3		59	6	2
747	RHOICOSPHENIA CURVATA	3		8	2	
568	ACHNANTHES LANCEOLATA	2		15	77	23
582	AMPHORA VENETA	2			4	
1168	BACILLARIA PARADOXA	2			2	
689	CRATICULA CUSPIDATA	2			1	
595	CYCLOTELLA MENEGHINIANA	2		6	8	4
686	DIADESMIS CONFERVACEA	2	2		2	
658	GOMPHONEMA ANGUSTATUM	2	6		5	
3179	GOMPHONEMA MEXICANUM	2		2	2	2
1471	MELOSIRA VARIANS	2		5	7	
1384	NAVICULA ERIFUGA	2			14	1
1386	NAVICULA INGENUA	2				22
714	NAVICULA SUBMINISCULA	2		6	4	1
694	NAVICULA TRIVIALIS	2		2		
718	NAVICULA VENETA	2	1		7	
986	NAVICULA VIRIDULA	2		1	12	4
726	NITZSCHIA AMPHIBIA	2	255	22	16	9
988	NITZSCHIA AMPHIBIOIDES	2			2	
989	NITZSCHIA FILIFORMIS	2			1	
732	NITZSCHIA FRUSTULUM	2	5			
991	NITZSCHIA INCONSPICUA	2	16		24	
704	SELLAPHORA PUPULA	2	3		8	
752	SURIRELLA ANGUSTA	2				2
758	SYNEDRA ULNA	2		2	6	
728	TRYBLIONELLA CALIDA	2				2
667	GOMPHONEMA PARVULUM	1	16	11	10	10
697	NAVICULA MINIMA	1	164	154	44	164
735	NITZSCHIA PALEA	1			2	
737	NITZSCHIA SOLITA	1			1	
711	SELLAPHORA SEMINULUM	1	11		3	46
4507	CYMBELLA HUSDTEDTII V STIGMATA	*			4	
5073	GOMPHONEMA MCLAUGHLINI	*	6		2	
5071	NAVICULA ANTONII	*			5	
4502	NAVICULA EXIGUA	*			2	
5034	NAVICULA LEPTOSTRIATA	*		3		2
4469	NAVICULA SAVANNIANA	*			6	2
4334	NITZSCHIA ANGUSTATUM	*			1	
1873	number of organisms		500	500	500	500
1877	number of taxon		15	22	55	29
3019	Pollution Tolerance Index		1.644	2.247	2.369	2.081
3020	CYMBELLA richness		0	2	3	1
3021	% Motile Taxa		91.8	37.2	33.2	52.4
3059	% similarity to ref. condition		9	25.086	36.057	28.886

Param	Lowest Identified Taxon	PTI	Fort Branch at Glencrest Drive 126 7/10/06	Fort Branch above Manor Rd 125 7/10/06	Fort Branch at Carson Hill 898	Fort Branch at N. Boggy 123
580	AMPHORA INARIENSIS	4	8			
4981	CYMBELLA TURGIDULA	4		2		
1251	SYNEDRA NANA	4		4		
566	ACHNANTHES EXIGUA	3	7	151		
2040	ACHNANTHIDIUM MINUTISSIMUM	3		48		
577	AMPHORA MONTANA	3		42	dry	dry
581	AMPHORA PEDICULUS	3	156			
587	CALONEIS BACILLUM	3	2			
594	COCCONEIS PLACENTULA	3	6			
4324	CYMBELLA MEXICANA	3		4		
618	DENTICULA KUETZINGI	3	6			
628	DIPLONEIS PUELLA	3	1			
2047	ENCYONEMA EVERGLADIANUM	3		4		
656	GOMPHONEMA AFFINE	3	4	2		
663	GOMPHONEMA GRACILE	3		1		
970	GOMPHONEMA GROVEI VAR. LINGULATUM	3	2			
3872	GOMPHONEMA PUMILUM	3	4			
670	GOMPHONEMA TRUNCATUM	3		2		
1382	NAVICULA CRYPTOTENELLA	3		2		
717	NAVICULA KOTSCHYI	3	10			
712	NAVICULA STROEMII	3		2		
747	RHOICOSPHENIA CURVATA	3	10			
568	ACHNANTHES LANCEOLATA	2	2			
595	CYCLOTELLA MENEGHINIANA	2	4			
1385	LUTICOLA GOEPPERTIANA	2	2			
1384	NAVICULA ERIFUGA	2		8		
1386	NAVICULA INGENUA	2	34	1		
693	NAVICULA LIBONENSIS	2	1			
714	NAVICULA SUBMINISCULA	2	1	5		
718	NAVICULA VENETA	2	4	3		
986	NAVICULA VIRIDULA	2	15	8		
726	NITZSCHIA AMPHIBIA	2	30	50		
988	NITZSCHIA AMPHIBIOIDES	2		2		
989	NITZSCHIA FILIFORMIS	2		2		
732	NITZSCHIA FRUSTULUM	2		1		
991	NITZSCHIA INCONSPICUA	2		36		
999	THALASSIOSIRA WEISSFLOGI	2		2		
729	TRYBLIONELLA APICULATA	2		1		
667	GOMPHONEMA PARVULUM	1	10	14		
697	NAVICULA MINIMA	1	121	75		
735	NITZSCHIA PALEA	1	10	20		
711	SELLAPHORA SEMINULUM	1	44			
4507	CYMBELLA HUSDTEDTII V STIGMATA	*		6		
5071	NAVICULA ANTONII	*	4			
5034	NAVICULA LEPTOSTRIATA	*	2			
5070	NITZSCHIA OBTUSA	*		2		
1873	number of organisms		500	500		
1877	number of taxon		27	29		
3019	Pollution Tolerance Index		2.079	2.327		
3020	CYMBELLA richness		0	4		
3021	% Motile Taxa		55.2	43.6		
3059	% similarity to ref. condition		17.657	22.114		

Diatoms - Harpers Branch Watershed 2006

Parameter	Lowest Identified Taxon	PTI	Harpers Branch at Woodland Ave 844 7/12/06
580	AMPHORA INARIENSIS	4	13
567	EUCOCCONEIS FLEXELLA	4	1
566	ACHNANTHES EXIGUA	3	2
2040	ACHNANTHIDIUM MINUTISSIMUM	3	6
581	AMPHORA PEDICULUS	3	138
587	CALONEIS BACILLUM	3	2
594	COCCONEIS PLACENTULA	3	1
618	DENTICULA KUETZINGII	3	2
628	DIPLONEIS PUELLA	3	1
651	FRAGILARIA FASCICULATA	3	1
656	GOMPHONEMA AFFINE	3	2
970	GOMPHONEMA GROVEI VAR. LINGULATUM	3	67
674	HANTZSCHIA AMPHIOXYS	3	1
687	NAVICULA CAPITATA VAR. HUNGARICA	3	5
717	NAVICULA KOTSCHYI	3	2
739	PINNULARIA GIBBA	3	5
2053	PLACONEIS PLACENTULA	3	2
746	REIMERIA SINUATA	3	2
747	RHOICOSPHENIA CURVATA	3	30
568	ACHNANTHES LANCEOLATA	2	10
1385	LUTICOLA GOEPPERTIANA	2	7
1386	NAVICULA INGENUA	2	95
980	NAVICULA SCHROETERII	2	2
694	NAVICULA TRIVIALIS	2	1
718	NAVICULA VENETA	2	2
986	NAVICULA VIRIDULA	2	3
726	NITZSCHIA AMPHIBIA	2	28
1253	NITZSCHIA CLAUSII	2	3
752	SURIRELLA ANGUSTA	2	3
758	SYNEDRA ULNA	2	1
697	NAVICULA MINIMA	1	54
5073	GOMPHONEMA MCLAUGHLINII	*	8
1873	number of organisms		500
1877	number of taxon		32
3019	Pollution Tolerance Index		2.494
3020	CYMBELLA richness		1
3021	% Motile Taxa		41
3059	% similarity to ref. condition		15.4

Diatoms - Johnson Creek Watershed 2006

Parameter	Lowest Identified Taxon	PTI	Johnson at Woodmont Avenue 897 7/7/06
1134	PINNULARIA ACROSPHAERIA	4	4
4981	CYMBELLA TURGIDULA	4	6
580	AMPHORA INARIENSIS	4	145
747	RHOICOSPHENIA CURVATA	3	68
742	PINNULARIA MICROSTAURON	3	1
739	PINNULARIA GIBBA	3	15
1435	PINNULARIA BOREALIS	3	1
674	HANTZSCHIA AMPHIOXYS	3	7
670	GOMPHONEMA TRUNCATUM	3	2
663	GOMPHONEMA GRACILE	3	4
656	GOMPHONEMA AFFINE	3	18
1250	EUNOTIA PECTINALIS	3	2
611	ENCYONEMA SILESIACUM	3	2
618	DENTICULA KUETZINGI	3	5
581	AMPHORA PEDICULUS	3	17
729	TRYBLIONELLA APICULATA	2	2
758	SYNEDRA ULNA	2	1
1439	SURIRELLA BREBISSONI	2	3
726	NITZSCHIA AMPHIBIA	2	126
986	NAVICULA VIRIDULA	2	6
1384	NAVICULA ERIFUGA	2	2
3179	GOMPHONEMA MEXICANUM	2	23
686	DIADESMIS CONFERVACEA	2	4
595	CYCLOTELLA MENEGHINIANA	2	2
689	CRATICULA CUSPIDATA	2	1
993	NITZSCHIA VITREA	1	4
735	NITZSCHIA PALEA	1	6
667	GOMPHONEMA PARVULUM	1	4
4507	CYMBELLA HUSDTEDTII V STIGMATA	*	19
1873	number of organisms		500
1877	number of taxon		29
3019	Pollution Tolerance Index		2.911
3020	CYMBELLA richness		3
3021	% Motile Taxa		30.8
3059	% similarity to ref. condition		9.657

Diatoms - Little Walnut Creek Watershed 2006

Param	Lowest Identified Taxon	PTI	Little Walnut at Golden Meadow 838 7/10/06	Little Walnut at Georgian 3860 7/10/06	Little Walnut at Cameron 3857 7/11/06	Little Walnut at Cameron 3857 7/11/06 Field Rep	Little Walnut at US183 634 7/6/06
604	CYMBELLA CYMBIFORMIS	4		3	4		
4981	CYMBELLA TURGIDULA	4	4	66	56	165	
642	FRAGILARIA ACUS	4		3			
565	ACHNANTHES BIASOLETTIANA	3		1			
2040	ACHNANTHIDIUM MINUTISSIMUM	3	242	87	161		
575	AMPHIPLEURA PELLUCIDA	3	8				
579	AMPHORA OVALIS	3				3	
587	CALONEIS BACILLUM	3	6	4		6	
592	CALONEIS SILICULA	3			2		
594	COCCONEIS PLACENTULA	3		2			
4324	CYMBELLA MEXICANA	3		4			
618	DENTICULA KUETZINGII	3	85	20	23	19	
2047	ENCYONEMA EVERGLADIANUM	3			8		
611	ENCYONEMA SILESIACUM	3	4	39	6	20	
1429	EUNOTIA BILUNARIS	3	1				
656	GOMPHONEMA AFFINE	3	15			8	
970	GOMPHONEMA GROVEI (var. lingulatum)	3	1		1		
670	GOMPHONEMA TRUNCATUM	3		3	4	3	
671	GYROSIGMA NODIFERUM	3			2		
688	NAVICULA CRYPTOCEPHALA	3	5	1			
717	NAVICULA KOTSCHYI	3	10	6	10		
709	NAVICULA RHYNCHOCEPHALA	3		2	2		
712	NAVICULA STROEMII	3		2	2		
4335	NITZSCHIA SINUATA VAR DELOGNE	3		11			
992	NITZSCHIA SINUATA VAR. TABELLARIA	3			1		
746	REIMERIA SINUATA	3	7		4	6	
689	CRATICULA CUSPIDATA	2				1	no diatoms
595	CYCLOTELLA MENEGHINIANA	2		6	21		present
686	DIADESMIS CONFERVACEA	2	12			1	in sample
3179	GOMPHONEMA MEXICANUM	2	3			2	
1471	MELOSIRA VARIANS	2		1			
1384	NAVICULA ERIFUGA	2	2				
980	NAVICULA SCHROETERII	2			1		
718	NAVICULA VENETA	2		1			
986	NAVICULA VIRIDULA	2		3			
726	NITZSCHIA AMPHIBIA	2	10	11	6	7	
991	NITZSCHIA INCONSPICUA	2		1			
704	SELLAPHORA PUPULA	2	1		2		
758	SYNEDRA ULNA	2	7	23	13	27	
999	THALASSIOSIRA WEISSFLOGII	2			1		
667	GOMPHONEMA PARVULUM	1	30	64	44	14	
697	NAVICULA MINIMA	1	4		20		
735	NITZSCHIA PALEA	1	2				
711	SELLAPHORA SEMINULUM	1			2		
4507	CYMBELLA HUSDTEDTII V STIGMATA	*	41	131	104	218	
4866	CYMBELLA TUMIDA	*		2			
5071	NAVICULA ANTONII	*		1			
5034	NAVICULA LEPTOSTRIATA	*		2			
1873	number of organisms		500	500	500	500	
1877	number of taxon		22	28	25	15	
3019	Pollution Tolerance Index		2.776	2.72	2.707	3.351	
3020	CYMBELLA richness		4	6	6	4	
3021	% Motile Taxa		9.2	7.8	9.2	1.8	
3059	% similarity to ref. condition		21.914	25.686	27.6	11.514	

Diatoms - Shoal Creek Watershed 2006

Param	Lowest Identified Taxon	PTI	Shoal d/s of Crosscreek Dr 118 7/7/06	Shoal at Shoal Edge Ct 117 7/7/06	Shoal at 24th St 116 7/7/06	Shoal above 1st St 122 7/5/06
580	AMPHORA INARIENSIS	4		2		
604	CYMBELLA CYMBIFORMIS	4	2			
4981	CYMBELLA TURGIDULA	4			24	
565	ACHNANTHES BIASOLETTIANA	3	3			
566	ACHNANTHES EXIGUA	3		6		2
2040	ACHNANTHIDIUM MINUTISSIMUM	3	86	53	85	36
577	AMPHORA MONTANA	3			4	4
581	AMPHORA PEDICULUS	3		10		2
584	BRACHYSIRA VITREA	3				3
587	CALONEIS BACILLUM	3		4	4	2
592	CALONEIS SILICULA	3		2		
594	COCCONEIS PLACENTULA	3		36	2	
618	DENTICULA KUETZINGI	3			6	2
611	ENCYONEMA SILESIACUM	3	10	10	36	
656	GOMPHONEMA AFFINE	3	3	10		
660	GOMPHONEMA CLAVATUM	3	4	2		
3872	GOMPHONEMA PUMILUM	3	16	5		
688	NAVICULA CRYPTOCEPHALA	3	3	1		
1382	NAVICULA CRYPTOTENELLA	3		3	5	
717	NAVICULA KOTSCHYI	3	2		1	2
730	NITZSCHIA DISSIPATA	3	4			2
747	RHOICOSPHENIA CURVATA	3	4			
748	RHOPALODIA GIBBA	3	1		2	
568	ACHNANTHES LANCEOLATA	2		2		4
595	CYCLOTELLA MENEGHINIANA	2	20	32	30	8
1389	FALLACIA MONOCULATA	2		4		
3179	GOMPHONEMA MEXICANUM	2	12	2		
1384	NAVICULA ERIFUGA	2				4
1386	NAVICULA INGENUA	2		1		1
980	NAVICULA SCHROETERII	2			3	
714	NAVICULA SUBMINISCULA	2	9			54
694	NAVICULA TRIVIALIS	2			7	2
718	NAVICULA VENETA	2	6	2	2	6
986	NAVICULA VIRIDULA	2		2	5	4
726	NITZSCHIA AMPHIBIA	2	28	24	22	
988	NITZSCHIA AMPHIBIOIDES	2		2		
1253	NITZSCHIA CLAUSII	2	1			
989	NITZSCHIA FILIFORMIS	2		2		
732	NITZSCHIA FRUSTULUM	2	1	18	9	4
991	NITZSCHIA INCONSPICUA	2	4	26	44	64
738	NITZSCHIA TROPICA	2		2		
752	SURIRELLA ANGUSTA	2		2		
758	SYNEDRA ULNA	2	23		1	
999	THALASSIOSIRA WEISSFLOGII	2		6		2
729	TRYBLIONELLA APICULATA	2				1
667	GOMPHONEMA PARVULUM	1	198	108	35	8
697	NAVICULA MINIMA	1	53	64	32	147
735	NITZSCHIA PALEA	1	6	44	16	62
993	NITZSCHIA VITREA	1				2
711	SELLAPHORA SEMINULUM	1		2		64
4507	CYMBELLA HUSDTEDTII V STIGMATA	*		10	124	6
4866	CYMBELLA TUMIDA	*				2
4502	NAVICULA EXIGUA	*	1			
5034	NAVICULA LEPTOSTRIATA	*		1	1	
1873	number of organisms		500	500	500	500
1877	number of taxon		25	34	24	28
3019	Pollution Tolerance Index		1.766	1.853	2.293	1.537
3020	CYMBELLA richness		2	2	3	2
3021	% Motile Taxa		23.6	39	29.2	83.8
3059	% similarity to ref. condition		27.514	27.771	25.114	19.343

Diatoms - Tannehill Watershed 2006

Parameter	Lowest Identified Taxon	PTI	Tannehill at Berkman Dr 3858 7/10/06	Tannehill at Lovell Dr 843 7/10/06	Tannehill at Desirable Dr 1476 7/6/06
4981	CYMBELLA TURGIDULA	4	10	4	
567	EUCOCCONEIS FLEXELLA	4	1		
566	ACHNANTHES EXIGUA	3	18	22	16
2040	ACHNANTHIDIUM MINUTISSIMUM	3	239	109	11
575	AMPHIPLEURA PELLUCIDA	3			3
577	AMPHORA MONTANA	3	1		4
581	AMPHORA PEDICULUS	3	4	4	
587	CALONEIS BACILLUM	3		3	2
593	COCCONEIS PEDICULUS	3		2	
594	COCCONEIS PLACENTULA	3	4	29	
618	DENTICULA KUETZINGI	3		8	4
611	ENCYONEMA SILESIACUM	3			10
670	GOMPHONEMA TRUNCATUM	3	1		
674	HANTZSCHIA AMPHIOXYS	3			2
1382	NAVICULA CRYPTOTENELLA	3		2	1
717	NAVICULA KOTSCHYI	3			2
707	NAVICULA RADIOSA	3		1	
733	NITZSCHIA LINEARIS	3	4		1
4335	NITZSCHIA SINUATA VAR DELOGNE	3	4		
746	REIMERIA SINUATA	3	2	12	
748	RHOPALODIA GIBBA	3		1	
568	ACHNANTHES LANCEOLATA	2			2
582	AMPHORA VENETA	2		1	
595	CYCLOTELLA MENEGHINIANA	2	24	20	22
686	DIADESMIS CONFERVACEA	2		4	
3179	GOMPHONEMA MEXICANUM	2	4	1	
1384	NAVICULA ERIFUGA	2		4	6
1386	NAVICULA INGENUA	2	1		
980	NAVICULA SCHROETERII	2		18	4
714	NAVICULA SUBMINISCULA	2	1	9	
718	NAVICULA VENETA	2	3		2
986	NAVICULA VIRIDULA	2	8	15	12
726	NITZSCHIA AMPHIBIA	2	47	18	42
1253	NITZSCHIA CLAUSII	2			2
989	NITZSCHIA FILIFORMIS	2		6	
732	NITZSCHIA FRUSTULUM	2	1		4
991	NITZSCHIA INCONSPICUA	2		28	22
734	NITZSCHIA MICROCEPHALA	2		2	
738	NITZSCHIA TROPICA	2		3	
704	SELLAPHORA PUPULA	2	4	2	2
758	SYNEDRA ULNA	2	6	16	
999	THALASSIOSIRA WEISSFLOGII	2			1
667	GOMPHONEMA PARVULUM	1	10	16	24
697	NAVICULA MINIMA	1	67	24	12
735	NITZSCHIA PALEA	1	34	40	45
993	NITZSCHIA VITREA	1		4	
711	SELLAPHORA SEMINULUM	1		4	4
4507	CYMBELLA HUSDTEDTII V STIGMATA	*		66	238
5071	NAVICULA ANTONII	*		2	
5034	NAVICULA LEPTOSTRIATA	*	2		
1873	number of organisms		500	500	500
1877	number of taxon		25	34	28
3019	Pollution Tolerance Index		2.378	2.262	1.889
3020	CYMBELLA richness		2	3	2
3021	% Motile Taxa		34.8	37.2	32.2
3059	% similarity to ref. condition		24.057	31.171	13.143

Diatoms - Waller Creek Watershed 2006

Param	Lowest Identified Taxon	PTI	Waller at 51st St 780 7/5/06	Waller upstream of 23rd St 624 7/5/06	Waller below Cesar Chavez 38 7/5/06	Waller below Cesar Chavez 38 7/5/06 Field Replica
580	AMPHORA INARIENSIS	4		1	2	
567	EUCOCCONEIS FLEXELLA	4	2			1
4472	SURIRELLA SPLENDIDA	4				1
566	ACHNANTHES EXIGUA	3	1		3	8
2040	ACHNANTHIDIUM MINUTISSIMUM	3	43			
577	AMPHORA MONTANA	3		3		2
579	AMPHORA OVALIS	3				2
581	AMPHORA PEDICULUS	3	10		8	6
584	BRACHYSIRA VITREA	3		1		
587	CALONEIS BACILLUM	3		14	1	1
594	COCCONEIS PLACENTULA	3			2	2
618	DENTICULA KUETZINGII	3		2	5	2
611	ENCYONEMA SILESIACUM	3			23	8
663	GOMPHONEMA GRACILE	3			4	
674	HANTZSCHIA AMPHIOXYS	3				2
1382	NAVICULA CRYPTOTENELLA	3	2			
717	NAVICULA KOTSCHYI	3		4	5	7
733	NITZSCHIA LINEARIS	3		1	8	4
748	RHOPALODIA GIBBA	3	2			
649	STAUROSIRA CONSTRUENS	3				2
568	ACHNANTHES LANCEOLATA	2	3	3		
582	AMPHORA VENETA	2		12	41	30
595	CYCLOTELLA MENEGHINIANA	2	29		18	15
686	DIADESMIS CONFERVACEA	2			1	3
1389	FALLACIA MONOCULATA	2			1	1
3179	GOMPHONEMA MEXICANUM	2			1	5
1384	NAVICULA ERIFUGA	2			3	3
1386	NAVICULA INGENUA	2			1	
980	NAVICULA SCHROETERII	2			1	
714	NAVICULA SUBMINISCULA	2	5	39		
718	NAVICULA VENETA	2	2			
986	NAVICULA VIRIDULA	2	4		26	37
726	NITZSCHIA AMPHIBIA	2	99	1	17	21
1253	NITZSCHIA CLAUSII	2	2			
991	NITZSCHIA INCONSPICUA	2	29	1	1	4
704	SELLAPHORA PUPULA	2			6	4
752	SURIRELLA ANGUSTA	2		8		1
758	SYNEDRA ULNA	2			3	
1433	TRYBLIONELLA LEVIDENSIS	2		1		
667	GOMPHONEMA PARVULUM	1	90	1	291	270
697	NAVICULA MINIMA	1	163	333	6	2
735	NITZSCHIA PALEA	1	5	51	10	46
711	SELLAPHORA SEMINULUM	1	6	2		
5068	AMPHORA HOLSATICA	*				1
5069	CYCLOSTEPHANOS DUBIUS	*				1
4507	CYMBELLA HUSDTEDTII V STIGMATA	*			4	3
4866	CYMBELLA TUMIDA	*	3		1	
5071	NAVICULA ANTONII	*		8		
5034	NAVICULA LEPTOSTRIATA	*			7	5
4469	NAVICULA SAVANNIANA	*		14		
1873	number of organisms		500	500	500	500
1877	number of taxon		19	20	29	32
3019	Pollution Tolerance Index		1.594	1.247	1.5	1.453
3020	CYMBELLA richness		1	0	3	2
3021	% Motile Taxa		63.4	92.6	17	26.6
3059	% similarity to ref. condition		20.114	8.971	12.457	10.486

Diatoms - Walnut Creek Watershed 2006

Param	Lowest Identified Taxon	PTI	Wells Br. Cr. Walnut Metro 463 7/10/06	Wells Br. Cr. Walnut Metro 463 7/10/06 Field Rep	Walnut Metric 895 06/13/06	Walnut Metric 895 06/13/06 Field Rep	Walnut IH-35 464 06/13/06	Walnut old Manor 502 06/14/06	Walnut SPRR Br. 503 06/14/06
667	AMPHORA INARIENSIS	4	8	8	14	4		24	
697	CYMBELLA TURGIDULA	4	1	8	9	2	14	2	52
1431	FRAGILARIA ACUS	4					2		
735	ACHNANTHES BIASOLETTIANA	3		2			10		2
568	ACHNANTHIDIUM MINUTISSIMUM	3	80	72	81	32	265	4	6
689	AMPHORA MONTANA	3							2
595	AMPHORA OVALIS	3	4	6	3			2	
673	AMPHORA PEDICULUS	3	32	48					
1471	CALONEIS BACILLUM	3	4	8	6	2		4	
4467	CALONEIS SCHUMANNIANA	3						2	10
1384	CALONEIS SILICULA	3	1	4	4		1	6	10
696	COCCONEIS PEDICULUS	3	3		12		4		
701	COCCONEIS PLACENTULA	3	33	18	63	308	32	289	194
1475	CYMBELLA HUSTEDTII	3							2
1472	DENTICULA KUETZINGI	3	12	8	121	28	53		14
980	DENTICULA SUBTILIS	3			4				
714	DIPLONEIS PUELLA	3	3	8					
715	ENCYONEMA ELGINENSE	3			1				
694	ENCYONEMA SILESIACUM	3	6	8	48	6	14	6	2
718	ENCYONEMA TRIANGULUM	3							1
986	FRAGILARIA CAPUCINA	3				4			2
726	FRAGILARIA ULNA	3			4	6	2	3	6
1253	GOMPHONEMA AFFINE	3			4	2		2	
732	GOMPHONEMA ANGUSTUM	3				3			
991	GOMPHONEMA TRUNCATUM	3					1		
758	GYROSIGMA NODIFERUM	3	3	7					
999	NAVICULA CAPITATA (var. hungarica)	3	8						
729	NAVICULA CRYPTOCEPHALA	3							1
1433	NAVICULA CRYPTOTENELLA	3	5				2		1
565	NAVICULA KOTSCHYI	3	16	20	3		2	1	2
2040	NAVICULA RADIOSA	3	7						
577	NAVICULA STROEMII	3	71	34			28		
579	NITZSCHIA DISSIPATA	3	4	12					
581	NITZSCHIA SINUATA VAR DELOGNE	3	13	2					
587	PINNULARIA GIBBA	3		3					
1415	REIMERIA SINUATA	3	13	15	19		4	147	47
592	ACHNANTHES LANCEOLATA	2	7			1			
593	CRATICULA CUSPIDATA	2		1					
594	CYCLOTELLA MENEGHINIANA	2	7	12			10		2
606	GYROSIGMA ACUMINATUM	2						1	
618	MELOSIRA VARIANS	2		6					
1170	NAVICULA CAPITATORADIATA	2				1	2		
628	NAVICULA ERIFUGA	2	6	20					
3202	NAVICULA MENISCULUS	2	2						
611	NAVICULA PLACENTULA (pseudanglica)	2						2	
613	NAVICULA RECENS	2						4	2
644	NAVICULA SANCTAECRUCIS	2		2	2				
1261	NAVICULA SCHROETERII	2	1	4					
656	NAVICULA SUBMINISCULA	2	2	1					
657	NAVICULA SYMMETRICA	2				1			
670	NAVICULA TRIVIALIS	2		2					
671	NAVICULA VENETA	2	2	2			2		
687	NAVICULA VIRIDULA	2		2		1	2		
688	NITZSCHIA AMPHIBIA	2	4		22	14	2		4
1382	NITZSCHIA CLAUSII	2		2					
717	NITZSCHIA FRUSTULUM	2		5					
707	NITZSCHIA INCONSPICUA	2	14	1		1	6		2
712	SYNEDRA ULNA	2	7	7					
730	THALASSIOSIRA WEISSFLOGII	2	1	2					
4335	TRYBLIONELLA APICULATA	2		2			2		1
739	TRYBLIONELLA LEVIDENSIS	2		2					
746	GOMPHONEMA PARVULUM	1	10	12					8
580	NAVICULA MINIMA	1	74	105					
4981	NAVICULA SALINICOLA	1					1		
642	NITZSCHIA PALEA	1		4			2		2
4322	CALONEIS AEROPHILA	*				1			
5134	CYMBELLA EXCISA	*				1	10		28
4507	CYMBELLA HUSDTEDTII V STIGMATA	*	14	2	80	80	25	1	97
5139	GEISSLERIA CUMMEROWII	*					2		
2475	GOMPHOSPHENIA REICHELTII (G.grovelii	*				2			
5071	NAVICULA ANTONII	*		3					
5034	NAVICULA LEPTOSTRIATA	*	19	8					
4469	NAVICULA SAVANNIANA	*	3						
5072	NITZSCHIA SILIQUA	*		2					
1873	number of organisms		500	500	500	500	500	500	500
1877	number of taxon		37	43	19	21	27	17	26
3019	Pollution Tolerance Index		2.543	2.384	2.998	2.969	2.965	3.038	3.056
3020	CYMBELLA richness		4	4	5	4	5	4	7
3021	% Motile Taxa		46.4	45.6	5.4	3.6	10.2	1.4	3
3059	% similarity to ref. condition		43.657	41.743	49.4	50.9	55.3	55.3	55.2

Diatoms - West Bouldin Creek Watershed 2006

Parameter	Lowest Identified Taxon	PTI	West Bouldin at Cardinal 3856 7/5/06	West Bouldin at Oltorf St 3854 7/11/06	West Bouldin at Post Oak 2794
580	AMPHORA INARIENSIS	4	2		
4981	CYMBELLA TURGIDULA	4		10	
567	EUCOCCONEIS FLEXELLA	4	3		
565	ACHNANTHES BIASOLETTIANA	3	2		
566	ACHNANTHES EXIGUA	3	1	4	
2040	ACHNANTHIDIUM MINUTISSIMUM	3	8	10	
579	AMPHORA OVALIS	3	2		
581	AMPHORA PEDICULUS	3		2	
587	CALONEIS BACILLUM	3		4	
603	CYMBELLA CISTULA	3	1		
618	DENTICULA KUETZINGI	3	274	34	
1170	DENTICULA SUBTILIS	3	2		
2047	ENCYONEMA EVERGLADIANUM	3	2		
656	GOMPHONEMA AFFINE	3	20	9	
660	GOMPHONEMA CLAVATUM	3		6	dry
663	GOMPHONEMA GRACILE	3	3	12	
970	GOMPHONEMA GROVEI VAR. LINGULATUM	3	2		
670	GOMPHONEMA TRUNCATUM	3		3	
688	NAVICULA CRYPTOCEPHALA	3		4	
1382	NAVICULA CRYPTOTENELLA	3		1	
717	NAVICULA KOTSCHYI	3	2	7	
739	PINNULARIA GIBBA	3	2		
746	REIMERIA SINUATA	3	4		
747	RHOICOSPHENIA CURVATA	3		4	
595	CYCLOTELLA MENEGHINIANA	2		2	
686	DIADESMIS CONFERVACEA	2		2	
3179	GOMPHONEMA MEXICANUM	2	6	2	
1385	LUTICOLA GOEPPERTIANA	2		2	
1384	NAVICULA ERIFUGA	2		6	
714	NAVICULA SUBMINISCULA	2		1	
694	NAVICULA TRIVIALIS	2	5	3	
718	NAVICULA VENETA	2		2	
986	NAVICULA VIRIDULA	2		8	
726	NITZSCHIA AMPHIBIA	2	26	159	
1253	NITZSCHIA CLAUSII	2	1		
732	NITZSCHIA FRUSTULUM	2	7	26	
991	NITZSCHIA INCONSPICUA	2		12	
758	SYNEDRA ULNA	2	2	9	
667	GOMPHONEMA PARVULUM	1	115	55	
697	NAVICULA MINIMA	1	2	28	
735	NITZSCHIA PALEA	1	1	10	
711	SELLAPHORA SEMINULUM	1		2	
4507	CYMBELLA HUSDTEDTII V STIGMATA	*	2	61	
5073	GOMPHONEMA MCLAUGHLINII	*	3		
1873	number of organisms		500	500	
1877	number of taxon		27	32	
3019	Pollution Tolerance Index		2.438	2.057	
3020	CYMBELLA richness		4	2	
3021	% Motile Taxa		8.8	54.6	
3059	% similarity to ref. condition		9.657	18.286	

Diatoms - Williamson Creek Watershed 2006

Parameter	Lowest Identified Taxon	PTI	Williamson at Hwy 71 490 7/7/06	Williamson at IH35 491 7/11/06	Williamson at McKinney Falls 223 7/6/06
580	AMPHORA INARIENSIS	4			1
4981	CYMBELLA TURGIDULA	4			14
567	EUCOCCONEIS FLEXELLA	4		1	
566	ACHNANTHES EXIGUA	3		8	1
2040	ACHNANTHIDIUM MINUTISSIMUM	3		10	12
577	AMPHORA MONTANA	3		4	
579	AMPHORA OVALIS	3			4
581	AMPHORA PEDICULUS	3			10
587	CALONEIS BACILLUM	3		6	2
1415	CALONEIS SCHUMANNIANA	3			2
593	COCCONEIS PEDICULUS	3			45
594	COCCONEIS PLACENTULA	3		1	
618	DENTICULA KUETZINGI	3		4	64
611	ENCYONEMA SILESIACUM	3		10	38
1429	EUNOTIA BILUNARIS	3		1	
644	FRAGILARIA CAPUCINA	3			12
656	GOMPHONEMA AFFINE	3		13	2
660	GOMPHONEMA CLAVATUM	3			8
663	GOMPHONEMA GRACILE	3		12	2
670	GOMPHONEMA TRUNCATUM	3			9
688	NAVICULA CRYPTOCEPHALA	3		4	
1382	NAVICULA CRYPTOTENELLA	3		3	
717	NAVICULA KOTSCHYI	3		5	2
707	NAVICULA RADIOSA	3			2
730	NITZSCHIA DISSIPATA	3			1
733	NITZSCHIA LINEARIS	3	no diatoms in sample	4	1
4335	NITZSCHIA SINUATA VAR DELOGNE	3			4
746	REIMERIA SINUATA	3			7
747	RHOICOSPHENIA CURVATA	3			8
748	RHOPALODIA GIBBA	3		6	
568	ACHNANTHES LANCEOLATA	2		8	
595	CYCLOTELLA MENEGHINIANA	2		28	27
686	DIADESMIS CONFERVACEA	2			18
3179	GOMPHONEMA MEXICANUM	2		2	8
1471	MELOSIRA VARIANS	2			7
1384	NAVICULA ERIFUGA	2		5	
1386	NAVICULA INGENUA	2		4	
980	NAVICULA SCHROETERII	2		2	
694	NAVICULA TRIVIALIS	2		8	
986	NAVICULA VIRIDULA	2		4	
726	NITZSCHIA AMPHIBIA	2		94	46
732	NITZSCHIA FRUSTULUM	2		31	4
991	NITZSCHIA INCONSPICUA	2		12	7
738	NITZSCHIA TROPICA	2		3	1
704	SELLAPHORA PUPULA	2		6	
758	SYNEDRA ULNA	2		6	51
667	GOMPHONEMA PARVULUM	1		72	43
697	NAVICULA MINIMA	1		85	
735	NITZSCHIA PALEA	1		14	
2153	RHOPALODIA BREBISSONII	1			2
711	SELLAPHORA SEMINULUM	1		5	
4507	CYMBELLA HUSDTEDTII V STIGMATA	*		6	34
5073	GOMPHONEMA MCLAUGHLINII	*		10	
5071	NAVICULA ANTONII	*		1	
4469	NAVICULA SAVANNIANA	*		2	
4334	NITZSCHIA ANGUSTATUM	*			1
1873	number of organisms			500	500
1877	number of taxon			38	36
3019	Pollution Tolerance Index			1.827	2.475
3020	CYMBELLA richness			2	4
3021	% Motile Taxa			58.4	17.4
3059	% similarity to ref. condition			18.429	21.2

Appendix C:

Summary Tables by Watershed
2006 EII Phase I

* Sample Sites are presented from upstream to downstream

Criteria for Identifying Values Which Exceed the Expected Range		
Parameter	**numerical criteria****	**narrative criteria**
Conductivity (uS/cm)	> 807	> 1 standard deviation from 2006 Phase 1 mean value
D.O. (mg/l)	< 4.96	< 1 standard deviation from 2006 Phase 1 mean value
E.Coli. (colonies/100ml)	> 2067.1	> 1 standard deviation from 2006 Phase 1 mean value
NH3-N (mg/l)	> 0.11	> 1 standard deviation from 2006 Phase 1 mean value
NO3-N (mg/l)	> 1.08	> 1 standard deviation from 2006 Phase 1 mean value
Ortho-P (mg/l)	> 0.19	> 1 standard deviation from 2006 Phase 1 mean value
pH (Standard units)	> 8.26 or < 7.36	>< 1 standard deviation from 2006 Phase 1 mean value
SO4 (mg/l)		> 1 standard deviation from 2006 Phase 1 mean value
TSS (mg/l)	> 9.53	> 1 standard deviation from 2006 Phase 1 mean value
Turbidity (NTU)	> 9.79	> 1 standard deviation from 2006 Phase 1 mean value

** values which exceed the criteria shown in this table are highlighted in orange in the tables of Appendix C

QC flags are indicated to the right of each value. QC flag and qualifier abbreviations are:

U	Useable
J	Estimated
S	Exceeds standard range
R	Rejected, failed QC
LE	Lab Error
SE	Sample Error
<	less than detectable range
>	greater than detectable range

WATERSHED	SITE	DATE	Cond. uS/cm <>	value	flag	DO MG/L <>	value	flag	E coli MPN/100ML <>	value	flag	NH3-N MG/L <>	value	flag	NO3-N MG/L <>	value	flag	Ortho-P MG/L <>	value	flag	pH Standard units <>	value	flag	SO4 MG/L <>	value	flag	TSS MG/L <>	value	flag	Turb. NTU <>	value	flag	Temp. Deg C <>	value	flag
BARTON																																		
Barton	48	02/22/06		601.2	U		7.34	U		18.0	R	<	0.02	J		0.07	U		0.04	J		7.96	U		47.7	U		0.67	J		1.30	U		12.15	U
Barton	48	05/18/06		646.8	U		7.50	U		2000.0	U	J	0.01	S		0.09	R		0.02	J		7.73	U		54.3	U		0.90	J		1.16	J		22.60	U
Barton	48	08/23/06		609.1	U		6.12	U		140.0	U	J	0.02	S		0.02	R		0.04	U		7.81	U		36.0	U		0.80	S		0.93	R		28.46	S
Barton	48	11/29/06		653.4	U		4.74	S		21.0	U	<J	0.01	S		0.19	R	<	0.02	R		7.74	U		42.4	U		4.43	R		1.67	R		20.13	U
		Site Mean		**627.6**			**6.43**			**544.8**			**0.01**			**0.09**			**0.03**			**7.81**			**45.1**			**1.70**			**1.27**			**20.84**
Barton	49	02/22/06		591.9	U		6.99	U	<	10.0	R		0.03	J		0.08	U		0.02	J		7.80	U		55.1	U	<	0.50	J		1.58	J		13.86	U
Barton	49	08/23/06		756.9	U		6.21	U		22.0	U		0.03	S	<	0.02	R		0.05	U		7.46	U		66.0	U		1.43	S		2.24	R		30.14	S
		Site Mean		**674.4**			**6.60**			**16.0**			**0.03**			**0.05**			**0.04**			**7.63**			**60.6**			**0.97**			**1.91**			**22.00**
Barton	51	02/22/06		671.6	U		6.72	U		14.0	U		0.05	U		0.31	U		0.02	J		7.03	S		61.2	U		0.57	J		0.65	J		12.68	U
Barton	51	05/18/06		700.6	U		8.09	U		21.0	U		0.02	S		0.71	R		0.03	J		7.56	U		58.5	U		2.70	J		0.78	J		22.47	U
Barton	51	08/23/06		767.2	U		4.10	S	<J	2.0	U		0.08	S		0.22	R		0.06	U		7.12	S		32.9	U		8.53	S		3.26	R		27.21	U
Barton	51	11/29/06		770.4	U		5.70	U		13.0	U	<J	0.01	S		0.45	R		0.05	R		7.62	U		64.5	U		1.13	R		5.32	R		19.58	U
		Site Mean		**772.45**			**6.15**			**12.5**			**0.04**			**0.42**			**0.04**			**7.33**			**54.3**			**3.23**			**2.50**			**20.49**
Barton	879	05/18/06		557.4	U		7.94	U		75.0	U	J	0.01	S		0.14	R		0.02	U		7.15	S		30.8	U		1.39	J		2.57	J		24.12	U
		Site Mean		**557.4**			**7.94**			**75.0**			**0.01**			**0.14**			**0.02**			**7.15**			**30.8**			**1.39**			**2.57**			**24.12**
		Watershed Mean		**666.0**			**6.50**			**212.4**			**0.03**			**0.21**			**0.03**			**7.54**			**49.9**			**2.10**			**1.95**			**21.22**
BLUNN																																		
Blunn	180	02/22/06		1155.0	S		7.61	U		360.0	U		0.03	J	<	0.02	S		0.04	J		6.86	S		107.0	U		1.81	J		2.69	J		14.97	U
Blunn	180	05/18/06		913.8	U		7.40	U		690.0	U		0.02	S		0.25	R		0.05	J		7.71	U		71.5	U		10.29	J		1.46	J		19.41	U
Blunn	180	08/23/06		1064.0	S		4.29	S		220.0	U		0.04	S		0.15	R		0.42	S		7.55	U					4.63	S		0.56	R		27.21	S
Blunn	180	11/29/06		975.0	S		3.33	S		37.0	U	<J	0.01	J	<	0.02	R		0.08	R		7.26	U		81.6	U		3.24	R		6.22	R		20.69	U
		Site Mean		**1027.0**			**5.66**			**326.8**			**0.02**			**0.11**			**0.15**			**7.35**			**86.7**			**4.99**			**2.73**			**20.57**
Blunn	362	02/22/06		672.1	U		8.44	U		210.0	U		0.03	J		0.52	U		0.06	J		7.87	U		44.2	U		1.20	J		1.53	J		12.18	U
Blunn	362	05/18/06		697.9	U		7.67	U		870.0	U	J	0.01	S		1.06	R		0.06	J		7.88	U		41.0	U		1.57	J		0.91	J		18.75	U
Blunn	362	08/23/06		613.0	U		1.93	S		2200.0	U		0.08	S		0.07	R		0.15	U		7.55	U					2.73	S		8.37	R		26.72	S
Blunn	362	11/29/06		605.0	U					53.0	U	<J	0.01	J		0.08	R		0.04	R		7.69	U		39.3	U	<	0.50	R		0.74	R		19.97	U
		Site Mean		**647.0**			**6.01**			**833.3**			**0.03**			**0.43**			**0.08**			**7.75**			**41.5**			**1.50**			**2.89**			**19.41**
Blunn	364	02/22/06		651.1	U		9.22	U		245.0	U		0.03	J		0.37	U		0.04	J		7.58	U		44.7	U		1.38	J		1.26	J		13.08	U
Blunn	364	05/18/06		633.2	U		6.58	U		2400.0	U	J	0.01	S		1.02	R		0.06	J		6.74	S		40.8	U		1.03	J		0.91	J		19.43	U
Blunn	364	08/23/06		183.0	S		5.44	S		2200.0	U		0.63	S		2.13	R		0.31	U		7.76	U					1.30	S		1.18	R		28.54	S
Blunn	364	11/29/06		616.0	U					81.0	U	<J	0.01	J		1.35	R		0.09	R		7.20	U		38.8	U	<	0.50	R		0.38	R		20.53	U
		Site Mean		**520.8**			**7.08**			**1046.0**			**0.17**			**1.22**			**0.13**			**7.32**			**41.4**			**1.05**			**0.93**			**20.40**
		Watershed Mean		**731.6**			**6.19**			**779.7**			**0.07**			**0.59**			**0.12**			**7.47**			**56.5**			**2.52**			**2.18**			**20.12**
BOGGY																																		
Boggy	837	02/22/06		715.2	U		10.04	U		36.0	U		0.05	U	<	0.02	S		0.06	J		7.83	U		53.5	U		2.33	J		2.03	J		14.75	U
Boggy	837	05/18/06		715.9	U		5.54	U		360.0	U		0.03	S		0.61	R		0.08	J		7.90	U		62.4	U		2.50	J		1.06	J		23.54	U
Boggy	837	11/29/06		562.0	U					27.0	U	<J	0.01	J		0.03	R		0.15	R		7.33	U		43.7	U		2.24	R		3.28	R		22.44	U
		Site Mean		**664.4**			**7.79**			**141.0**			**0.03**			**0.22**			**0.10**			**7.69**			**53.2**			**2.36**			**2.12**			**20.24**
Boggy	2754	02/22/06		776.0	U		8.82	U		2900.0	U		0.04	J		0.04	S		0.06	J		7.76	U		50.7	U		1.00	J		1.31	J		12.51	U
Boggy	2754	05/18/06		764.0	U		6.25	U		2000.0	U	J	0.02	S		0.19	R		0.09	J		7.53	U		48.3	U		3.14	J		1.40	J		19.93	U
Boggy	2754	11/29/06		687.0	U		2.66	S		1300.0	U		0.04	S	<	0.02	R		0.16	R		7.43	U		48.7	U	<	0.50	R		1.66	R		20.06	U
		Site Mean		**742.3**			**5.91**			**2066.7**			**0.03**			**0.08**			**0.10**			**7.57**			**49.2**			**1.55**			**1.46**			**17.50**
		Watershed Mean		**703.4**			**6.66**			**1103.8**			**0.03**			**0.15**			**0.10**			**7.63**			**51.2**			**1.95**			**1.79**			**18.87**

WATERSHED	SITE	DATE	Cond. uS/cm <> value	flag	DO MG/L <> value	flag	E coli MPN/100ML <> value	flag	NH3-N MG/L <> value	flag	NO3-N MG/L <> value	flag	Ortho-P MG/L <> value	flag	pH Standard units <> value	flag	SO4 MG/L <> value	flag	TSS MG/L <> value	flag	Turb. NTU <> value	flag	Temp. Deg C <> value	flag
BUTTERMILK BRANCH																								
Buttermilk Branch	782	05/18/06		716.0	U	5.62	S		340.0	U		0.02	S		1.39	R		0.02	J		7.32	U	49.7	U	1.13	J	1.27	J	23.44	U
		Site Mean		**716.0**		**5.62**			**340.0**			**0.02**			**1.39**			**0.02**			**7.32**		**49.7**		**1.13**		**1.27**		**23.44**	
Buttermilk Branch	851	02/22/06		554.0	U	10.07	U		410.0	U		0.09	U		0.43	U		0.08	J		8.17	U	44.0	U	53.33	J	83.20	J	13.75	U
Buttermilk Branch	851	05/18/06		594.0	U	9.55	U		770.0	U	J	0.01	S		0.68	R		0.02	J		8.27	U	46.2	U	0.56	J	0.67	J	21.57	U
Buttermilk Branch	851	08/23/06		485.0	S	8.80	U		4000.0	U		0.02	S		0.22	R		0.06	U		8.29	U	36.3	U	0.80	S	1.32	R	28.53	S
Buttermilk Branch	851	11/29/06		636.0	U	8.00	U		170.0	U	<J	0.01	S		0.06	R		0.02	R		7.91	U	40.6	U	<	0.50	R	0.93	R	21.15	U
		Site Mean		**567.3**		**9.11**			**1337.5**			**0.03**			**0.35**			**0.05**			**8.16**		**41.8**		**13.80**		**21.53**		**21.25**	
Buttermilk Branch	3861	02/22/06		811.0	U	7.16	U		2400.0	U		0.05	U		2.32	U		0.02	J		7.16	S	44.2	U	4.18	J	0.68	J	18.79	U
Buttermilk Branch	3861	05/18/06		814.0	U	5.20	S	>	2419.2	U	J	0.02	S		2.17	R		0.05	J		7.18	U	49.3	U	2.87	J	0.56	J	21.81	U
Buttermilk Branch	3861	08/23/06		669.0	U	4.10	S		3500.0	U		0.02	S		4.01	R		0.05	U		7.47	U	36.4	U	<	0.50	U	2.39	R	26.47	S
Buttermilk Branch	3861	11/29/06		853.0	U	1.60	S		730.0	U		0.30	S		2.27	R		0.05	R		7.22	U	42.2	U	5.50	R	0.91	R	22.65	U
		Site Mean		**786.8**		**4.52**			**2262.3**			**0.10**			**2.69**			**0.04**			**7.26**		**43.0**		**3.26**		**1.14**		**22.43**	
		Watershed Mean		**681.3**		**6.68**			**1637.7**			**0.06**			**1.51**			**0.04**			**7.67**		**43.2**		**7.71**		**10.21**		**22.02**	
EAST BOULDIN																								
East Bouldin	119	02/22/06		792.1	U	7.41	U		210.0	U		0.02	J		0.27	U		0.05	J		7.90	U	67.2	U	2.20	J	1.48	J	13.05	U
East Bouldin	119	05/18/06		775.3	U	6.48	U		4800.0	U		0.02	S		0.58	R		0.07	J		7.88	U	64.6	U	1.00	J	0.84	J	20.51	U
East Bouldin	119	11/29/06		632.0	U	.	.	.	14.0	U		0.07	J		0.03	R		0.15	R		7.07	S	25.0	U	1.03	R	1.64	R	19.25	U
		Site Mean		**733.1**		**6.95**			**1734.8**			**0.04**			**0.29**			**0.09**			**7.62**		**52.3**		**1.41**		**1.32**		**17.60**	
East Bouldin	121	02/22/06		451.6	U	2.79	S		73.0	U		0.28	U	<	0.02	S		0.25	J		7.44	U	17.7	U	4.24	J	5.20	J	13.04	U
East Bouldin	121	05/18/06		782.5	U	2.56	S		310.0	U		0.05	S		0.05	R		0.07	J		7.07	S	24.4	U	5.30	J	4.59	J	20.56	U
		Site Mean		**617.1**		**2.68**			**191.5**			**0.17**			**0.04**			**0.16**			**7.26**		**21.1**		**4.77**		**4.90**		**16.80**	
East Bouldin	1338	02/22/06		622.9	U	6.32	U		191.0	U		0.04	J		0.06	U		0.06	J		7.83	U	57.0	U	0.60	J	1.59	J	14.63	U
East Bouldin	1338	05/18/06		648.1	U	6.38	U		1100.0	U	J	0.02	S		0.10	R		0.08	J		6.96	S	46.2	U	3.80	J	1.14	J	19.70	U
		Site Mean		**635.5**		**6.35**			**645.5**			**0.03**			**0.08**			**0.07**			**7.40**		**51.6**		**2.20**		**1.37**		**17.17**	
		Watershed Mean		**672.1**		**5.32**			**1149.8**			**0.07**			**0.16**			**0.10**			**7.45**		**43.2**		**2.60**		**2.35**		**17.25**	
EAST COUNTRY CLUB (see also West Country Club)																								
East Country Club	1475	02/22/06		1233.0	S	9.21	U		182.0	U		0.03	J		0.25	U		0.10	J		7.85	U	136.0	U	13.50	J	6.33	J	13.28	U
East Country Club	1475	11/29/06		634.0	U	3.41	S		200.0	U	<J	0.01	S		0.05	R		0.10	R		7.59	U	60.4	U	0.57	R	2.71	R	21.48	U
		Site Mean		**933.5**		**6.31**			**191.0**			**0.02**			**0.15**			**0.10**			**7.72**		**98.2**		**7.04**		**4.52**		**17.38**	
		Watershed Mean		**933.5**		**6.31**			**191.0**			**0.02**			**0.15**			**0.10**			**7.72**		**98.2**		**7.04**		**4.52**		**17.38**	
FORT BRANCH																								
Fort Branch	125	02/22/06		544.0	U	9.16	U		159.0	U		0.05	U	<	0.02	S		0.03	J		8.14	U	36.1	U	0.43	J	0.98	J	12.90	U
Fort Branch	125	05/18/06		604.0	U	7.64	U		160.0	U	J	0.02	S	<	0.02	R		0.03	J		8.21	U	62.4	U	3.10	J	6.38	J	23.78	U
Fort Branch	125	11/29/06		454.0	S	5.04	S		18.0	U	<J	0.01	S	<	0.02	R		0.10	R		7.94	U	32.1	U	0.63	R	2.50	R	21.60	U
		Site Mean		**534.0**		**7.28**			**112.3**			**0.02**			**0.02**			**0.05**			**8.10**		**43.5**		**1.39**		**3.29**		**19.43**	
Fort Branch	126	02/22/06		542.0	U	12.35	U		600.0	U		0.03	J		0.34	U		0.48	J		7.75	U	35.7	U	2.32	J	2.88	J	13.70	U
Fort Branch	126	05/18/06		609.0	U	6.58	U	>	2419.2	U	J	0.02	U		0.65	R		0.12	J		7.82	U	35.0	U	1.83	J	2.32	J	20.60	U
Fort Branch	126	08/23/06		877.0	U	7.84	U		1600.0	U		0.03	S		0.77	R		0.49	S		8.14	U	78.1	U	5.57	S	3.41	R	27.40	S
Fort Branch	126	11/29/06		528.0	U	3.49	S		820.0	U	<J	0.01	S		0.04	R		0.29	R		7.70	U	33.7	U	4.37	R	5.78	R	21.13	U
		Site Mean		**639.0**		**7.57**			**1359.8**			**0.02**			**0.45**			**0.35**			**7.85**		**45.6**		**3.52**		**3.60**		**20.71**	
		Watershed Mean		**594.0**		**7.44**			**825.2**			**0.02**			**0.27**			**0.22**			**7.96**		**44.7**		**2.61**		**3.46**		**20.16**	

WATERSHED	SITE	DATE	Cond. uS/cm <>	value	flag	DO MG/L <>	value	flag	E coli MPN/100ML <>	value	flag	NH3-N MG/L <>	value	flag	NO3-N MG/L <>	value	flag	Ortho-P MG/L <>	value	flag	pH Standard units <>	value	flag	SO4 MG/L <>	value	flag	TSS MG/L <>	value	flag	Turb. NTU <>	value	flag	Temp. Deg C <>	value	flag
HARPER'S BRANCH																																		
Harper's Branch	844	02/22/06		848.7	U		4.89	S		3300.0	U		0.03	J		1.02	U		0.09	J		6.86	S		65.0	U		1.63	J		1.32	J		15.96	U
Harper's Branch	844	05/18/06		932.5	U		2.78	S		1100.0	U		0.03	S		1.37	R		0.07	J		7.24	U		58.1	U		2.90	J		1.55	J		20.05	U
Harper's Branch	844	11/29/06		786.0	U					76.0	U	<J	0.01	J		0.38	R	<	0.02	R		7.12	S		52.0	U		2.17	R		2.25	R		21.50	U
		Site Mean		**855.7**			**3.84**			**1492.0**			**0.02**			**0.92**			**0.06**			**7.07**			**58.4**			**2.23**			**1.71**			**19.17**	
		Watershed Mean		**855.7**			**3.84**			**1492.0**			**0.02**			**0.92**			**0.06**			**7.07**			**58.4**			**2.23**			**1.71**			**19.17**	
HARRIS BRANCH (one sample taken during a follow-up site visit in response to high bacteria values during 2005)																																		
Harris Branch	1199	02/22/06								250.0	U																							
		Site Mean								**250.0**																								
		Watershed Mean								**250.0**																								
JOHNSON																																		
Johnson	897	05/18/06		609.0	U		5.26	S	>	2419.2	U		0.03	S		0.40	R		0.47	J		7.63	U		76.4	U		5.67	J		5.70	J		18.63	U
Johnson	897	11/29/06		610.1	U		0.56	S	>	4839.2	U		0.43	S		0.05	R		0.43	R		7.30	U		67.9	U		6.27	R		16.70	R		19.88	U
		Site Mean		**609.6**			**2.91**			**3629.2**			**0.23**			**0.23**			**0.45**			**7.47**			**72.2**			**5.97**			**11.20**			**19.26**	
		Watershed Mean		**609.6**			**2.91**			**3629.2**			**0.23**			**0.23**			**0.45**			**7.47**			**72.2**			**5.97**			**11.20**			**19.26**	
LITTLE WALNUT																																		
Little Walnut	634	02/22/06		594.0	U		10.83	U		36.0	U		0.04	J		0.41	U		0.02	J		8.09	U		55.1	U		2.10	J		2.24	J		12.04	U
Little Walnut	634	05/18/06		488.0	U		8.02	U		59.0	U	J	0.01	S		0.36	R		0.04	J		8.08	U		47.1	U		2.17	J		0.85	J		23.75	U
Little Walnut	634	08/23/06		532.0	U		7.05	U		54.0	U	J	0.02	S		0.09	R		0.04	U		7.86	U		59.1	U		2.03	S		3.13	R		30.96	S
Little Walnut	634	11/29/06		576.4	U		7.44	U		85.0	U	<J	0.01	S	<	0.02	R		0.03	R		8.08	U		53.4	U	<	0.50	R		1.28	R		21.46	U
		Site Mean		**547.6**			**8.34**			**58.5**			**0.02**			**0.22**			**0.03**			**8.03**			**53.7**			**1.70**			**1.88**			**22.05**	
Little Walnut	838	02/22/06		704.0	U		11.93	U		2600.0	U		0.05	U		0.36	U		0.03	J		8.12	U		46.3	U		1.57	J		2.12	J		13.17	U
Little Walnut	838	05/18/06		642.0	U		9.33	U	>	2419.2	U		0.02	S		1.58	R		0.02	J		7.94	U		37.9	U		0.97	J		2.35	J		22.86	U
Little Walnut	838	11/29/06		640.9	U		9.25	U		1700.0	U	<J	0.01	S	<	0.02	R		0.08	R		8.04	U		33.6	U		2.30	R		2.33	R		21.49	U
		Site Mean		**662.3**			**10.17**			**1694.6**			**0.03**			**0.65**			**0.04**			**8.03**			**39.3**			**1.61**			**2.27**			**19.17**	
Little Walnut	3857	02/22/06		671.0	U		11.62	U		45.0	U		0.05	U		0.53	U	<	0.02	J		8.13	U		45.7	U		0.80	J		0.73	J		13.79	U
Little Walnut	3857	05/18/06		575.0	U		8.67	U		93.0	U		0.02	U		0.80	R		0.05	J		7.89	U		40.4	U		0.50	J		1.16	J		23.44	U
Little Walnut	3857	08/23/06		580.8	U		7.86	U		41.0	U		0.02	U		0.44	R	<	0.02	J		9.93	S		35.1	U		0.73	S		1.03	R		30.00	S
Little Walnut	3857	11/29/06		605.0	U		8.18	U		40.0	U	<J	0.01	S		0.29	R		0.02	R		7.78	U		41.4	U		0.53	R		0.95	R		21.33	U
		Site Mean		**608.0**			**9.08**			**54.8**			**0.02**			**0.52**			**0.03**			**8.43**			**40.7**			**0.64**			**0.97**			**22.14**	
Little Walnut	3860	02/22/06		655.0	U		14.50	S		27.0	U		0.04	J		0.33	U		0.02	J		8.20	U		46.0	U		1.20	J		1.57	J		13.88	U
Little Walnut	3860	05/18/06		606.0	U		10.23	U		200.0	U	J	0.01	S		0.93	R		0.02	J		7.97	U		39.8	U		0.67	J		1.01	J		24.51	S
Little Walnut	3860	08/23/06		574.8	U		10.52	U		630.0	U		0.03	S		0.14	R		0.04	U		8.08	U		38.5	U		6.09	S		1.32	R		30.91	S
Little Walnut	3860	11/29/06		597.0	U		11.60	U		50.0	U	<J	0.01	S		0.09	R		0.02	R		8.00	U		39.7	U	<	0.50	R		0.58	R		21.89	U
		Site Mean		**608.2**			**11.71**			**226.8**			**0.02**			**0.37**			**0.03**			**8.06**			**41.0**			**2.12**			**1.12**			**22.80**	
		Watershed Mean		**602.8**			**9.80**			**578.4**			**0.02**			**0.43**			**0.03**			**8.15**			**43.9**			**1.51**			**1.51**			**21.70**	

WATERSHED	SITE	DATE	Cond. uS/cm <>	value	flag	DO MG/L <>	value	flag	E coli MPN/100ML <>	value	flag	NH3-N MG/L <>	value	flag	NO3-N MG/L <>	value	flag	Ortho-P MG/L <>	value	flag	pH Standard units <>	value	flag	SO4 MG/L <>	value	flag	TSS MG/L <>	value	flag	Turb. NTU <>	value	flag	Temp. Deg C <>	value	flag
SHOAL																																	
Shoal	116	02/22/06		866.0	U		10.84	U		2800.0	U		0.04	J		0.19	U		0.02	J		7.75	U		112.0	U		2.40	J		0.91	J		11.71	U
Shoal	116	05/18/06		915.0	U		6.97	U	>	2419.2	U	J	0.02	S		0.71	R		0.03	J		7.79	U		117.0	U		0.63	J		1.07	J		19.72	U
Shoal	116	11/29/06		860.6	U		6.30	U		4800.0	U	<J	0.01	S	<	0.02	R		0.03	R		7.85	U		137.0	U		4.37	R		3.18	R		20.95	U
		Site Mean		**880.5**			**8.04**			**2105.8**			**0.02**			**0.31**			**0.03**			**7.80**			**122.0**			**2.47**			**1.72**			**17.46**
Shoal	117	02/22/06		493.0	U		6.98	U		520.0	U		0.04	J		0.06	U		0.03	J		8.02	U		56.1	U		0.47	J		1.70	J		11.01	U
Shoal	117	05/18/06		625.0	U		7.29	U		1000.0	U	J	0.01	S		1.08	R		0.02	J		7.73	U		71.5	U		0.80	J		1.71	J		21.14	U
Shoal	117	11/29/06		448.4	U		4.58	S		6.0	U		0.02	S		0.03	R		0.06	R		7.63	U		36.9	U		4.26	R		4.54	R		20.33	U
		Site Mean		**522.1**			**6.28**			**405.2**			**0.03**			**0.39**			**0.04**			**7.79**			**54.8**			**1.84**			**2.65**			**17.49**
Shoal	118	02/22/06		621.0	U		10.47	U		55.0	U		0.04	J		0.06	U		0.02	J		7.90	U		55.6	U		3.54	J		1.00	J		12.60	U
Shoal	118	05/18/06		570.0	U		9.28	U		1100.0	U		0.02	S		0.03	R		0.02	J		7.94	U		36.0	U		0.87	J		0.85	J		20.96	U
Shoal	118	11/29/06		631.8	U		3.20	S		19.0	U	<J	0.01	S	<	0.02	R		0.04	R		7.38	U		25.5	U		1.77	R		2.15	R		20.95	U
		Site Mean		**607.6**			**7.65**			**416.8**			**0.02**			**0.04**			**0.03**			**7.74**			**39.0**			**2.06**			**1.33**			**18.17**
Shoal	122	02/22/06		769.0	U		9.60	U		159.0	U		0.20	U		1.74	U		0.22	J		7.85	U		65.0	U		2.37	J		1.40	J		14.36	U
Shoal	122	05/18/06		643.0	U		7.32	U	>	2419.2	U		0.04	S		0.57	R		0.23	J		7.87	U		67.6	U		1.77	J		1.43	J		21.20	U
Shoal	122	08/23/06		844.0	U		6.64	U	>	4839.2	U		0.07	S		2.14	R		0.43	S		7.96	U		40.8	U		9.23	S		7.75	R		27.02	S
Shoal	122	11/29/06		870.0	U		6.66	U		550.0	U		0.04	S		1.29	R		0.41	R		7.07	S		75.0	U		0.53	R		1.96	R		20.72	U
		Site Mean		**781.5**			**7.56**			**1991.9**			**0.09**			**1.44**			**0.32**			**7.69**			**62.1**			**3.48**			**3.14**			**20.83**
		Watershed Mean		**704.4**			**7.40**			**1189.8**			**0.04**			**0.61**			**0.12**			**7.75**			**68.9**			**2.54**			**2.28**			**18.67**
TANNEHILL BRANCH																																	
Tannehill Branch	843	02/22/06		659.0	U		9.72	U		36.0	U		0.03	J		0.22	U		0.05	J		7.99	U		45.0	U		1.40	J		2.23	J		11.01	U
Tannehill Branch	843	05/18/06		494.0	U		7.84	U		150.0	U	J	0.01	S		0.06	R		0.02	J		8.09	U		45.5	U		0.90	J		1.44	J		22.85	U
Tannehill Branch	843	11/29/06		672.0	U		6.89	U		100.0	U	<J	0.01	S	<	0.02	R		0.03	R		7.90	U		56.9	U		6.83	R		4.91	R		21.13	U
		Site Mean		**608.3**			**8.15**			**95.3**			**0.02**			**0.10**			**0.03**			**7.99**			**49.1**			**3.04**			**2.86**			**18.33**
Tannehill Branch	1476	11/29/06		598.0	U					4.0	U		0.04	J		0.13	R		0.07	R		7.15	S		57.5	U		1.91	R		1.78	R		22.05	U
		Site Mean		**598.0**						**4.0**			**0.04**			**0.13**			**0.07**			**7.15**			**57.5**			**1.91**			**1.78**			**22.05**
Tannehill Branch	3858	02/22/06		515.0	U		10.44	U		400.0	U		0.05	U		0.06	U	<	0.02	J		8.07	U		41.8	U		0.80	J		2.04	J		11.86	U
Tannehill Branch	3858	05/18/06		462.0	S		9.55	U		180.0	U		0.05	S		0.07	R	<	0.02	J		8.55	S		52.6	U		1.53	J		1.26	J		24.57	S
Tannehill Branch	3858	11/29/06		564.0	U		5.88	U		260.0	U	<J	0.01	S	<	0.02	R	<	0.02	R		7.74	U		61.9	U		0.97	R		1.41	R		20.52	U
		Site Mean		**513.7**			**8.62**			**280.0**			**0.03**			**0.05**			**0.02**			**8.12**			**52.1**			**1.10**			**1.57**			**18.98**
		Watershed Mean		**566.3**			**8.39**			**161.4**			**0.03**			**0.08**			**0.03**			**7.93**			**51.6**			**2.05**			**2.15**			**19.14**

WATERSHED	SITE	DATE	Cond. uS/cm <> value flag	DO MG/L <> value flag	E coli MPN/100ML <> value flag	NH3-N MG/L <> value flag	NO3-N MG/L <> value flag	Ortho-P MG/L <> value flag	pH Standard units <> value flag	SO4 MG/L <> value flag	TSS MG/L <> value flag	Turb. NTU <> value flag	Temp. Deg C <> value flag
WALLER													
Waller	38	02/22/06	727.0 U	9.90 U	410.0 U	0.05 U	0.75 U	0.07 U	8.08 U	70.0 U	0.94 J	2.38 J	11.23 U
Waller	38	05/18/06	840.0 U	5.86 U	1100.0 U	0.04 S	1.56 R	0.09 J	7.94 U	80.1 U	1.60 U	1.34 U	20.94 U
Waller	38	08/23/06	633.0 U	4.30 S	4000.0 U	0.05 S	0.36 R	0.26 U	7.79 U	49.8 U	3.40 S	1.39 R	27.67 S
Waller	38	11/29/06	802.0 U	4.86 S	2400.0 U	0.05 S	0.50 R	0.17 R	7.28 U	66.1 U	0.67 R	1.18 R	20.06 U
		Site Mean	**750.5**	**6.23**	**1918.3**	**0.05**	**0.79**	**0.15**	**7.77**	**66.5**	**1.65**	**1.57**	**19.98**
Waller	624	02/22/06	839.0 U	9.54 U	580.0 U	0.10 U	1.09 U	0.05 J	7.85 U	82.3 U	53.33 J	1.73 J	13.23 U
Waller	624	05/18/06	908.0 U	7.90 U	920.0 U	J 0.02 S	1.78 R	0.09 J	7.93 U	84.5 U	1.04 J	1.10 J	20.94 U
Waller	624	08/23/06	519.0 U	6.73 U	320.0 U	0.02 S	0.49 R	0.21 U	8.00 U	42.1 U	1.67 S	2.87 R	27.71 S
Waller	624	11/29/06	772.0 U	6.45 U	150.0 U	<J 0.01 S	0.34 R	0.14 R	7.50 U	65.3 U	2.34 R	1.53 R	20.57 U
		Site Mean	**759.5**	**7.66**	**492.5**	**0.04**	**0.93**	**0.12**	**7.82**	**68.6**	**14.60**	**1.81**	**20.61**
Waller	780	02/22/06	732.0 U	10.86 U	100.0 U	0.05 U	< 0.02 S	0.06 J	8.33 U	102.0 U	1.46 J	0.65 J	12.40 U
Waller	780	05/18/06	653.0 U	8.92 U	> 2419.2 U	J 0.01 S	0.05 R	0.04 J	8.35 U	45.1 U	10.81 J	3.76 J	20.85 U
Waller	780	11/29/06	726.0 U	4.43 S	1700.0 U	<J 0.01 S	< 0.02 R	0.13 R	7.76 U	45.0 U	< 0.50 R	1.17 R	20.70 U
		Site Mean	**703.7**	**8.07**	**1406.4**	**0.02**	**0.03**	**0.08**	**8.15**	**64.0**	**4.26**	**1.86**	**17.98**
		Watershed Mean	**741.0**	**7.25**	**1361.5**	**0.04**	**0.63**	**0.12**	**7.89**	**66.6**	**7.07**	**1.74**	**19.66**
WALNUT													
Walnut	464	02/22/06	580.0 U	10.59 U	109.0 U	0.04 J	0.04 S	< 0.02 U	8.21 U	44.0 U	0.53 S	1.12 U	11.82 U
Walnut	464	05/18/06	605.0 U	10.35 U	190.0 U	J 0.01 S	1.45 R	0.04 J	8.07 U	48.0 U	0.13 J	0.85 U	20.59 U
Walnut	464	08/23/06	668.2 U	8.79 U	99.0 U	0.14 S	0.16 R	0.08 U	8.16 U	32.3 U	2.27 J	1.79 R	30.04 S
Walnut	464	11/29/06	579.2 U	7.57 U	27.0 U	<J 0.01 S	0.02 R	0.03 R	7.96 U	40.7 U	0.61 R	1.12 R	20.21 U
		Site Mean	**608.1**	**9.33**	**106.3**	**0.05**	**0.42**	**0.04**	**8.10**	**41.3**	**0.89**	**1.22**	**20.67**
Walnut	502	02/22/06	571.0 U	12.05 U	173.0 U	0.04 J	0.31 U	0.02 J	8.06 U	45.5 U	1.00 J	0.97 J	12.65 U
Walnut	502	05/18/06	570.0 U	7.57 U	160.0 U	J 0.01 S	0.94 R	0.03 J	7.94 U	46.2 U	0.57 J	0.77 J	20.96 U
Walnut	502	08/23/06	519.0 U	6.55 U	17.0 U	J 0.01 S	0.06 R	0.06 U	7.67 U	38.6 U	0.91 S	1.19 R	28.96 S
Walnut	502	11/29/06	571.1 U	7.79 U	65.0 U	<J 0.01 S	0.05 R	0.03 R	7.84 U	43.2 U	< 0.50 R	1.03 R	20.51 U
		Site Mean	**557.8**	**8.49**	**103.8**	**0.02**	**0.34**	**0.04**	**7.88**	**43.4**	**0.75**	**0.99**	**20.77**
Walnut	503	02/22/06	802.0 U	9.20 U	173.0 U	0.03 J	0.24 U	0.12 J	9.47 S	68.5 U		5.76 J	13.62 U
Walnut	503	05/18/06	550.1 U	8.72 U	94.0 U	J 0.01 S	0.72 R	0.04 J	8.14 U	51.2 U	5.97 J	3.74 J	22.22 U
Walnut	503	11/29/06	492.0 U		47.0 U	<J 0.01 J	< 0.02 R	0.02 R	7.86 U	52.3 U	1.03 R	2.49 R	20.57 U
		Site Mean	**614.7**	**8.96**	**104.7**	**0.02**	**0.33**	**0.06**	**8.49**	**57.3**	**3.50**	**4.00**	**18.80**
Walnut	895	02/22/06	705.0 U	10.65 U	230.0 U	0.04 J	0.31 U	< 0.02 J	7.90 U	66.6 U	0.70 J	0.96 J	13.71 U
Walnut	895	05/18/06	642.0 U	8.92 U	770.0 U	J 0.01 S	0.55 R	0.03 J	7.87 U	57.9 U	0.30 J	1.35 J	21.44 U
Walnut	895	08/23/06	555.3 U	10.06 U	> 4839.2 U	J 0.02 S	1.28 R	0.05 U	7.88 U	29.0 U	< 0.50 U	1.40 R	29.09 S
Walnut	895	11/29/06	688.3 U	9.88 U	3500.0 U	<J 0.01 S	0.13 R	0.03 R	7.79 U	55.3 U	< 0.50 R	1.41 R	20.86 U
		Site Mean	**647.7**	**9.88**	**2334.8**	**0.02**	**0.57**	**0.03**	**7.86**	**52.2**	**0.50**	**1.28**	**21.28**
		Watershed Mean	**606.5**	**9.19**	**699.5**	**0.03**	**0.42**	**0.04**	**8.06**	**48.0**	**1.11**	**1.73**	**20.48**
WELLS BRANCH (In Walnut Watershed)													
Wells Branch	463	02/22/06	614.0 U	10.81 U	64.0 U	0.04 J	0.19 U	0.02 J	8.06 U	44.9 U	1.97 J	0.62 J	10.96 U
Wells Branch	463	05/18/06	642.0 U	8.66 U	550.0 U	J 0.01 S	1.60 R	0.02 J	7.92 U	42.8 U	< 0.50 J	0.97 J	19.42 U
Wells Branch	463	08/23/06	458.4 U	7.09 U	110.0 U	0.03 S	0.04 R	0.05 U	8.10 U	26.3 U	0.57 S	2.17 R	29.08 S
Wells Branch	463	11/29/06	605.1 U	6.59 U	200.0 U	<J 0.01 S	< 0.02 R	0.04 R	7.87 U	36.5 U	< 0.50 R	1.29 R	20.03 U
		Site Mean	**579.9**	**8.29**	**222.3**	**0.02**	**0.46**	**0.03**	**7.99**	**37.6**	**0.89**	**1.26**	**19.87**
		Watershed Mean	**579.9**	**8.29**	**222.3**	**0.02**	**0.46**	**0.03**	**7.99**	**37.6**	**0.89**	**1.26**	**19.87**

WATERSHED	SITE	DATE	Cond. uS/cm <> value flag	DO MG/L <> value flag	E coli MPN/100ML <> value flag	NH3-N MG/L <> value flag	NO3-N MG/L <> value flag	Ortho-P MG/L <> value flag	pH Standard units <> value flag	SO4 MG/L <> value flag	TSS MG/L <> value flag	Turb. NTU <> value flag	Temp. Deg C <> value flag
WEST BOULDIN													
West Bouldin	3854	02/22/06	487.2 U	13.16 U	18.0 U	0.03 J	0.16 U	0.11 U	8.97 S	41.4 U	1.35 S	1.45 U	13.88 U
West Bouldin	3854	05/18/06	603.1 U	13.12 U	870.0 U	0.03 S	0.38 R	0.06 U	8.30 S	51.0 U	1.08 J	0.58 S	23.44 U
West Bouldin	3854	08/23/06	371.0 S	12.48 U	180.0 U	J 0.02 S	0.22 R	0.17 U	9.47 S	28.1 U	9.06 J	1.34 R	30.45 S
West Bouldin	3854	11/29/06	386.0 S		310.0 U	0.02 J	0.28 R	0.27 R	7.78 U	32.5 U	1.41 R	1.56 R	21.63 U
		Site Mean	**461.8**	**12.92**	**344.5**	**0.03**	**0.26**	**0.15**	**8.63**	**38.3**	**3.23**	**1.23**	**22.35**
West Bouldin	3856	02/22/06	727.3 U	12.44 U	55.0 U	0.02 J	0.42 U	0.04 J	8.24 U	44.1 U	3.63 J	1.87 J	13.21 U
West Bouldin	3856	05/18/06	761.8 U	8.87 U	160.0 U	J 0.01 S	0.43 R	0.02 J	8.05 U	35.3 U	1.00 J	1.21 J	20.39 U
		Site Mean	**744.6**	**10.66**	**153.8**	**0.01**	**0.43**	**0.03**	**8.15**	**39.7**	**2.32**	**1.54**	**16.80**
		Watershed Mean	**556.1**	**12.01**	**249.1**	**0.02**	**0.32**	**0.11**	**8.47**	**38.7**	**2.92**	**1.34**	**20.50**
WEST COUNTRY CLUB													
West Country Clu	850	02/22/06	695.2 U	9.55 U	182.0 U	0.03 J	0.04 S	0.03 J	7.76 U	95.5 U	6.81 J	1.86 J	11.44 S
West Country Clu	850	05/18/06	708.7 U	9.24 U	820.0 U	J 0.02 S	0.13 R	0.04 J	7.89 U	96.7 U	3.74 J	2.08 J	26.74 U
West Country Clu	850	11/29/06	539.9 U	6.23 U	110.0 U	<J 0.01 S	< 0.02 R	0.05 R	7.87 U	79.6 U	2.20 R	2.57 R	21.69 U
		Site Mean	**647.9**	**8.34**	**370.7**	**0.02**	**0.06**	**0.04**	**7.84**	**90.6**	**4.25**	**2.17**	**19.96**
		Watershed Mean	**647.9**	**8.34**	**370.7**	**0.02**	**0.06**	**0.04**	**7.84**	**90.6**	**4.25**	**2.17**	**19.96**
WILLIAMSON													
Williamson	223	02/22/06	663.6 U	9.76 U	45.0 U	0.02 J	0.38 U	0.02 J	8.02 U	60.2 U	0.83 J	0.82 J	14.43 U
Williamson	223	05/18/06	610.3 U	11.49 U	160.0 U	J 0.01 S	0.38 R	0.02 J	7.85 U	46.3 U	1.03 J	0.78 J	24.40 U
Williamson	223	08/23/06	728.7 U	6.98 S	120.0 U	J 0.02 S	0.04 R	0.07 U	7.56 U	56.9 U	2.80 S	1.99 R	28.79 S
Williamson	223	11/29/06	751.7 U	8.47 U	86.0 U	<J 0.01 S	< 0.02 R	0.03 R	7.83 U	60.2 U	< 0.50 R	0.90 R	21.77 U
		Site Mean	**688.6**	**9.18**	**102.8**	**0.01**	**0.21**	**0.04**	**7.82**	**55.9**	**1.29**	**1.12**	**22.35**
Williamson	490	05/18/06	749.3 U	2.62 S	40.0 U	J 0.01 S	< 0.02 R	0.02 J	7.53 U	73.6 U	3.70 J	1.71 J	22.78 U
		Site Mean	**749.3**	**2.62**	**40.0**	**0.01**	**0.02**	**0.02**	**7.53**	**73.6**	**3.70**	**1.71**	**22.78**
Williamson	491	11/29/06	506.0 U	4.51 S	33.0 U	<J 0.01 S	0.04 R	0.04 R	7.61 U	29.2 U	0.63 R	1.46 R	19.81 U
		Site Mean	**506.0**	**4.51**	**33.0**	**0.01**	**0.04**	**0.04**	**7.61**	**29.2**	**0.63**	**1.46**	**19.81**
		Watershed Mean	**668.3**	**7.31**	**80.7**	**0.01**	**0.15**	**0.03**	**7.73**	**54.4**	**1.58**	**1.28**	**22.00**